PRELIMINARY ASSESSMENT
ZY-FORMER CRAIG AIR FORCE BASE/CRAIG AIR FIELD
SELMA, DALLAS COUNTY
EPA ID No.: ALD983183112
CERCLIS SITE REF. No.: 5867

Prepared By
Jake Hall
Alabama Department of Environmental Management
Land Division

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NFRAP APPROVED KT 5/28/98

1. INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA) and a cooperative agreement between the U. S. Environmental Protection Agency and the Alabama Department of Environmental Management (ADEM), a Preliminary Assessment (PA) was conducted at the ZY-Former Craig Air Force Base/Craig Field Air in Selma, Dallas County, Alabama. The purpose of this investigation was to collect information concerning conditions at the site sufficient to assess the threat posed to human health and the environment and to determine the need for additional investigation under CERCLA/SARA or other action. The scope of the investigation included a review of available file information, a comprehensive target survey, and a site reconnaissance on ZY-Former Craig AFB/Craig Field Air.

2. SITE DESCRIPTION, SITE HISTORY, AND WASTE CHARACTERISTICS

2.1 Location

The Civil Engineers Complex is located in Selma, Dallas County, Alabama (Fig. 1, Att. 1) It is located in the SW 1/4 of the NW 1/4 of Section 21, Township 16 North, Range 11 East.). The geographic coordinates of the site are 32° 21' 50.52" Latitude and 86° 38' 37.07" Longitude (Att. 2).

The climate in Dallas County is characterized by long, mild summers, resulting from moist tropical air from the Gulf of Mexico (Ref. 3). Winters are cool and fairly short and have an average winter temperature of 51° F. The average summer temperature is 82° F, and the average daily maximum temperature is 98° F. The average yearly temperature is 74.5. Maximum temperatures exceed 100° F. and minimum temperatures are less than ° F.

2.2 Site Description

The Civil Engineering Complex consisted of several wood frame buildings that were located near the golf course (Fig. 1, Att. 3-4). On December 6, 1993, the Dallas County Engineering Department was demolishing the old Corp of Engineers building when a 55-gallon drum was

ruptured. The crew that continued to work in the contaminated area became ill with dizziness, nausea, and eye irritation. Eight people became ill and 1 required a hospital visit. Debris was taken from the building was taken to 4 other locations. Ultimately the contaminated debris from Selmont Service Station was returned to the dumpsite. Subsequent samples which were taken to locate the most heavily contaminated soils did not detect any cyclohexanone. The materials were handled extensivley during the demolition process. It is assumed that the material was highly volatile and volatized during handling and removal back to Craig.

2.3 Operational History and Waste Characteristics

Before Craig Air force Base closed in 1977, the Civil Engineering Complex housed the base utility shops. This area handled all the plumbing, painting, refrigeration, electrical heating, and air conditioning buildings. Maintenance personnel worked from the area everyday doing typical ground maintenance throughout the entire base (Att. 3, Ref. 6).

3. GROUND WATER PATHWAY

3.1 Hydrogeologic Setting

Craig Field is situated in the Gulf Coastal Plain physiographic province. The province is Divided into four physiographic subdivisions in Dallas County. These are the Central Pine Belt, the Black Prairie, the Chunnenuggee Hills and the terraces and floodplains. Craig Field lies almost entirely in the terraces and flood pains physiographic subdivision. The terraces and flood plains subdivision consists mainly of the alluvium deposited by the Alabama River and its tributaries. This subdivision has been mapped as high terrace, intermediate terrace, low terrace, and alluvium deposits. The soils vary in texture from gravely and coarse sands to silts and clays. High terrace deposits form mesa-like plateaus in northeast and southeast Dallas County. The base of the deposits range from 300 to 400 feet in elevation (above mean sea level, National Geodetic Vertical Satum of 1929 amsl) and consist of yellowish-orange clay, silt, sand, and grave. Intermediate terrace deposits form relatively flat plains. Generally the base ranges in elevation from 150 to 200 feet amsl. Yellowish-orange to reddish-brown sand and gravel are the major constituents in this unit, but silt and clay are also present in appreciable quantities. Low

terrace deposits and alluvium lie beneath flood plains and adjacent low lands of the Alabama River and its tributaries. This unit consists of yellowish-orange coarse-grained sand and gravel with some silt and clay content. From the Alabama River to the base of the intermediate deposits the elevation ranges from 150 to 200 feet amsl. Beneath the terrace deposits and alluvium are Paleocene and upper Cretaceous sedimentary deposits of gravel, sand, silt, clay, limestone, sandstone, and chalk. These deposits vary in thickness from 750 feet in north Dallas County to 2600 Feet in the southern part. The formation names from the base of Cretaceous are: Coker Formation, Gordo Formation, Eutaw Formation, Mooreville Chalk, Demopolis Chalk, Ripley Formation, Prairie Bluff Formation and the Clayton Formation. These formations strike east southeastward (Att. 5, Ref. 8).

3.2 Ground Water Targets

The Dallas County area is served by the Dallas County Water & Fire Protection Authority (Ref. 8-9). All residents obtain potable water from the public water system. According to the water availability data from the county, 2 municipal water supply wells exist within a 4-mile radius of the base with none of these wells being within a 1-mile radius of the base. The closest well is 0.3 miles west direction from the site. These wells are screened at depths greater than 100 feet. Private water supply, industrial and irrigation wells are known to exist within 10 miles of the site. The citizens are supplied with water by the public water system that is not a blended system. Aquifers in the Coker, Gordo, Eutaw, and Ripley Formations, yield an adequate supply of water for domestic and stock use. Artesian aquifers in the Coker, Gordo, and Eutaw Formations are the principal sources of water. The lower feet of each unit are the most productive zones yielding as much as 1500 gallons per minute (gpm) (Att. 5).

3.3 Ground Water Conclusions

The primary source for public water supply in the area is groundwater (Att. 5). A release of CERCLA hazardous substances from the Civil Engineering Complex to groundwater, is not suspected because of the type of constituents involved at the site. The quality of the release was also very limited in size. It is highly unlikely that constituents from the spill could impact public water supplies since they are 0.3 miles from the site and at 270 feet, are of significant depths.

Consequently, installation of groundwater monitoring wells at this site would not be since later soil testing identified no measurable contamination.

4. SURFACE WATER PATHWAY

4.1 Hydrologic Setting

Drainage from the site flows toward the west and is located approximately 1/4 mile from the spill area. Overland drainage from Four-Mile Creek flows Southwest for approximately 5 miles at 0 cfs. Four-Mile Creek flows into the Six-Mile Creek at 0 cfs (Att. 1). Six-Mile Creek flows into the Alabama River that has a 2 year, 7 day low flow of 7.540 cfs. Portions of Craig AFB lie within the 100-year flood plain but outside within a minimal flood plain interval (Att. 9). The Alabama River (from the River Mile 131 to Frisco RR Crossing), Four Mile Creek, and Six-Mile Creek, are designated "Fish and Wildlife" areas (Ref. 14

4.2 Surface Water Targets

Two streams of significance drain the entire Craig Field complex-Four Mile Creek and Six-Mile Creek. Four-Mile Creek receives flow from Lake Craig, which drains the northern portion of Craig Field. Six-Mile Creek drains the southern portion of the site. Both streams converge west of S. R. 41 and flows into the Alabama River (Att. 1,3,5).

Common Name	*Listing*	*Distribution in Alabama*
Alabama Moccasionshell Muscle	Threatened	Alabama drainages
Fine-Line Pocketbook	Threatened	Alabama River drainage
Orange-Nacre Mucket	Threatened	Alabama drainage
Ovate Clubshell Mussell	Endangered	Statewide
Southern Clubshell Mussell	Endangered	Statewide except Mobile Delta/Alabama River drainage
Gulf Sturgeon	Threatened	Alabama River System

(Reference ; Reference)

4.3 Surface Water Conclusion

There are no visual indications of a release of contaminants to the surface water and the proximity of the source of contamination to surface water is such that there is a very high likelihood that contaminants have not reached the surface water via surface water drainage routes, general surface water flow down gradient of the site, etc. There are no drinking water intakes with 15 downstream miles of the site (Att. 1). Also, a release of CERCLA hazardous substances from the site is not suspected because of the overland distance the contaminants would have to travel, and also because of the composition of the suspected contaminant involved.

5. SOIL EXPOSURE AND AIR PATHWAY

5.1 Physical Conditions

The USDA Soil Survey indicates that the site is underlain by Savannah-Mashulaville-Quitman series soils. This series has deep, nearly level to sloping, moderately well drained to poorly drained soils that have a loamy subsoil formed from marine and old stream sediments of the Coastal Plain. The actual Civil Engineer's Complex location appears to lie in the Savannah-Urban land complex area of Craig AFB above the NE portion of the runway (Fig. -1). Areas of Savannah soils and Urban land are intricately mixed or very small. These areas have 1-8 % slope (Ref. 20). Generally, Savannah soils have a surface layer of dark grayish brown fine sandy

loam about 6 inches thick. The subsurface layer is pale brown and yellowish-brown fine sandy loam to a depth of 9 inches. The upper part of the subsoil is yellowish brown sandy clay loam, clay loam, and loam to a depth of 29 inches. The lower part is compact and brittle, mottled yellowish-brown, strong brown, and gray loam, clay loam, and sandy clay loam to a depth of 72 inches or more (Ref. 20).

The Urban Land portion of this complex is covered by sidewalks, streets, parking lots, buildings, runways, and other structures that so obscure the soils, that identification of the soils is not feasible. These areas have a high rate of runoff because the soils are covered (Ref. 20). The Craig AFB is an industrial and residential area and is accessible to the public. A chain-link fence surrounds the facility. The base grounds within the fenced area are mainly composed of grass and trees and is maintained (Att.3-4).

5.2 Soil and Air Targets

The Civil Engineering Complex is an inactive facility. There are residences located within a quarter of a mile radius of the site. There is 1 school located within a 2-mile radius of the site (Att. 1,3). The total population within a 4 mile radius of the site is an estimated 3,387.67 people (Att. 1). The area population is as follows:

Miles	*Residences*	*People Per Residence*	*Population*
0 - 1/4	*47*	*2.53*	*119*
1/4 - 1/2	*132*	*2.53*	*334*
1/2 - 1	*180*	*2.53*	*456*
1 - 2	*275*	*2.53*	*696*
2 - 3	*325*	*2.53*	*823*
3 - 4	*380*	*2.53*	*962*
Total Population			*3,390*

The population information given above was obtained from a map house count utilizing the USGS Quadrangle maps. The number utilized in the people/residents column is the number of

persons per household taken from the 1990 Census of Alabama Counties and Cities by race (Ref. 21

5.3 Soil Exposure and Air Pathway Conclusion

The soil exposure pathway is not considered a threat because the facility owners have excavated and aerated the soils. ADEM soil samples of June 7, 1995, indicated the soils were within acceptable range (Att. 7). A release to the air is not suspected at this time. On numerous site reconnaissance, the writer was unable to detect any type of distinct odor in the air.

6. SUMMARY AND CONCLUSIONS

Since the removal/disposal of contaminated soils has been accomplished earlier, it is our recommendation that this site be placed in the category of no further remedial action or study needed with regard to CERCLA or SARA. Currently, no areas of remaining contamination have been identified. Should further State evaluation indicate significant concerns, modifications to this recommendation would be provided.

7. REFERENCES

1. U.S.G.S. 7.5 Minute Series Topographic Quadrangle Maps of Alabama: Blackwell Bend, Alabama, Provisional Edition 1987; Burnsville, Alabama, Provisional Edition 1982; Sardis, Alabama, Provisional Edition 1982, Selma, Alabama, Provisional Edition 1977. Scale 1:24,000.

2. U.S. Environmental Protection Agency, Standard Operating Procedure to Determine Site Latitude and Longitude Coordinates, 1991. Calculation worksheet for the ZY-Former Craig Air Force Base/Craig Air Field

3. U.S. Department of Commerce, Environmental Services Administration, Climate Atlas of the United States, June 1968.

4. Hall, Jake, ADEM, Land Division, Hazardous Waste Branch, Site Assessment files for ZY-Former Craig Air Force Base/Craig Field Air in Selma, Dallas County, ALD983183112, Ref. No. 5867.

5. Hall, Jake, ADEM, Land Division, Hazardous Waste Branch, Photographs for ZY-Former Craig Air Force Base/Craig Field Air in Selma, Dallas County, ALD983183112, Ref. No. 5867.

6. Hall, Jake, ADEM, Land Division, Hazardous Waste Branch, Site Assessment Unit Personal Communication with G. E. Jones, September 1995.

7. Law Environmental, Inc., Pre-Final Volume II Sampling Plan for Remedial Investigation Study Former Craig Air Force Base, Selma, Alabama, March 1995.

8. Mooty, Will S., Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 7, U.S. Geological Survey, Water-Resources Investigations Report 87-4109, Tuscaloosa, Alabama, 1987.

9. Alabama Department of Environmental Management, Federal Reporting Data System (FRDS-II), Public Water Supply Summary. Municipal Drinking Water Supplies serving the communities in the vicinity of Former Craig AFB, Selma, Alabama.

10. ADEM, Land Division, Hazardous Waste Branch, Site Assessment Unit Analytical Reports.

11. Environmental Materials Consultants, Inc., Laboratory Analyses form TTL, Inc., March 28, 1994.

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12. Hayes, Eugene C., Geological Survey of Alabama, 1978, 7-Day Low Flows and Flow Duration of Alabama Streams Through 1973. Geological Survey of Alabama Bulletin 113.

13. Federal Emergency Management Agency, Flood Insurance Rate Maps, Dallas County, Alabama (Unincorporated Areas). Community Panel Number 0100630105B, Effective date: September 29, 1986.

14. ADEM, Water Division - Water Quality Program, Water Use Classification for Interstate and Intrastate Waters, Chapter 335-6-11, May 30, 1997.

15. U.S. Fish and Wildlife Service, "Endangered Species By County List," April 1994.

16. Federally Listed Endangered/Threatened Species by State, Alabama, July 12, 1995.

17. Teem, David H., et al., Alabama Agricultural Experiment Station, 1986, Vertebrate Animals of Alabama in Need of Special Attention.

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19. Reeves, Williard J., et al., United States Department of Agriculture Soil Conservation Service and Forest Service in cooperation with Alabama Department of Agriculture and Industries and Alabama Agricultural Experiment Station, Soil Survey of Dallas County, Alabama, Issued July 1979.

20. Alabama State Data Center, Center for Business and Economic Research, College of Commerce and Business Administration, The University of Alabama. 1990 CENSUS Alabama Counties and Cities By Race.

7. ATTACHMENTS

1. U.S.G.S. 7.5 Minute Series Topographic Quadrangle Maps of Alabama: Blackwell Bend, Alabama, Provisional Edition 1987; Burnsville, Alabama, Provisional Edition 1982; Sardis, Alabama, Provisional Edition 1982, Selma, Alabama, Provisional Edition 1977. Scale 1:24,000.

2. U.S. Environmental Protection Agency, Standard Operating Procedure to Determine Site Latitude and Longitude Coordinates, 1991. Calculation worksheet for the ZY-Former Craig Air Force Base/Craig Air Field

3. Hall, Jake, ADEM, Land Division, Hazardous Waste Branch, Site Assessment files for ZY-Former Craig Air Force Base/Craig Field Air in Selma, Dallas County, ALD983183112, Ref. No. 5867.

4. Hall, Jake, ADEM, Land Division, Hazardous Waste Branch, Photographs for ZY-Former Craig Air Force Base/Craig Field Air in Selma, Dallas County, ALD983183112, Ref. No. 5867.

5. Law Environmental, Inc., Pre-Final Volume II Sampling Plan for Remedial Investigation Study Former Craig Air Force Base, Selma, Alabama, March 1995.

6. ADEM, Land Division, Hazardous Waste Branch, Site Assessment Unit Analytical Reports.

7. Environmental Materials Consultants, Inc., Laboratory Analyses form TTL, Inc., March 28, 1994.

8. Hayes, Eugene C., Geological Survey of Alabama, 1978, 7-Day Low Flows and Flow Duration of Alabama Streams Through 1973. Geological Survey of Alabama Bulletin 113.

9. Federal Emergency Management Agency, Flood Insurance Rate Maps, Dallas County, Alabama (Unincorporated Areas). Community Panel Number 0100630105B, Effective date: September 29, 1986.

10. U.S. Fish and Wildlife Service, "Endangered Species By County List," April 1994.

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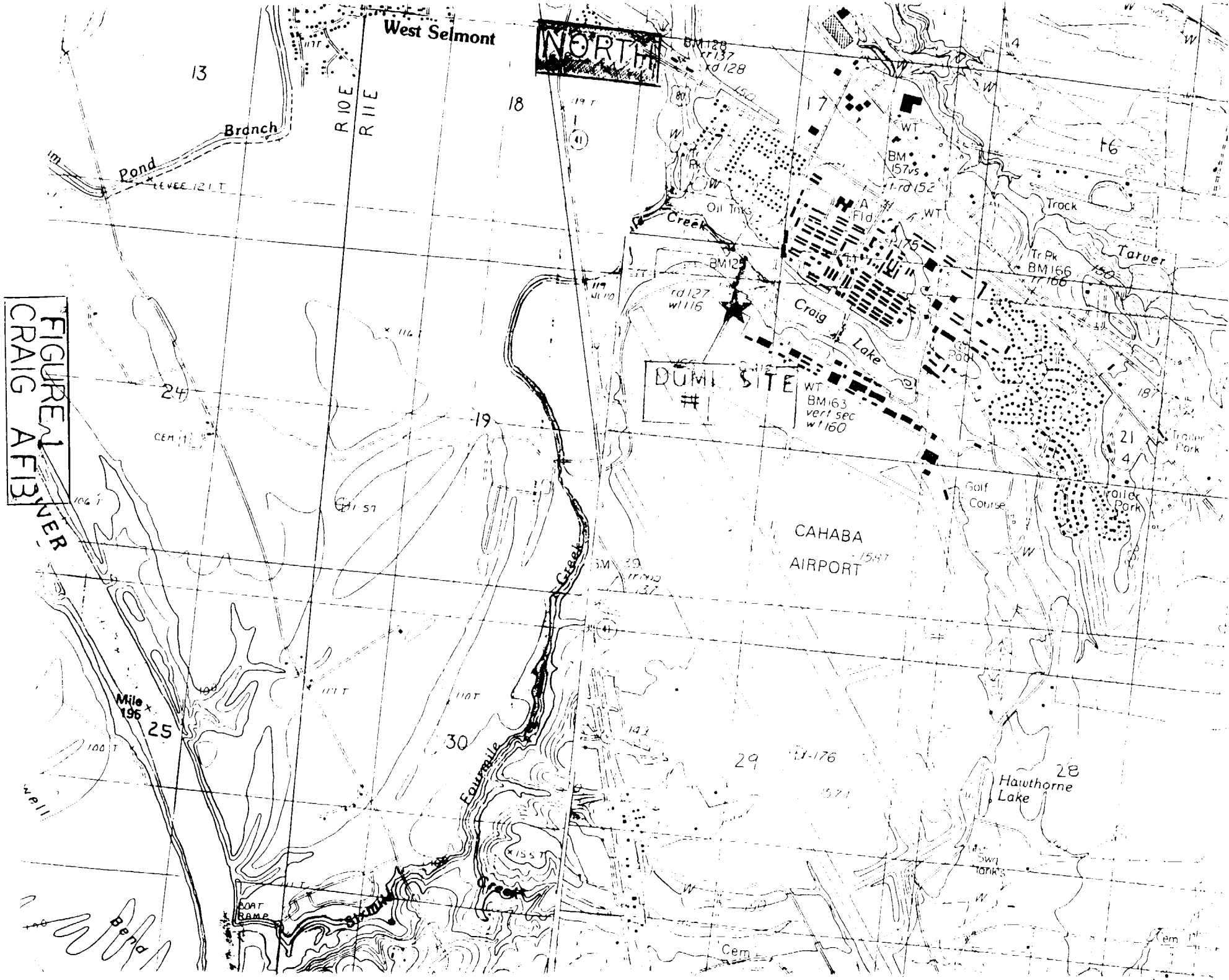
FIGURE 1
CRAIG AFB
West Selmont
NORTH
R10E
R11E
Branch
Pond
Creek
Craig
Lake
DUMP SITE
#1
CAHABA
AIRPORT
Golf
Course
Trailer
Park
Hawthorne
Lake
Tarver
Track
Oil Tnks
Swl
tanks
Fourmile
Creek
Mile
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RAMP
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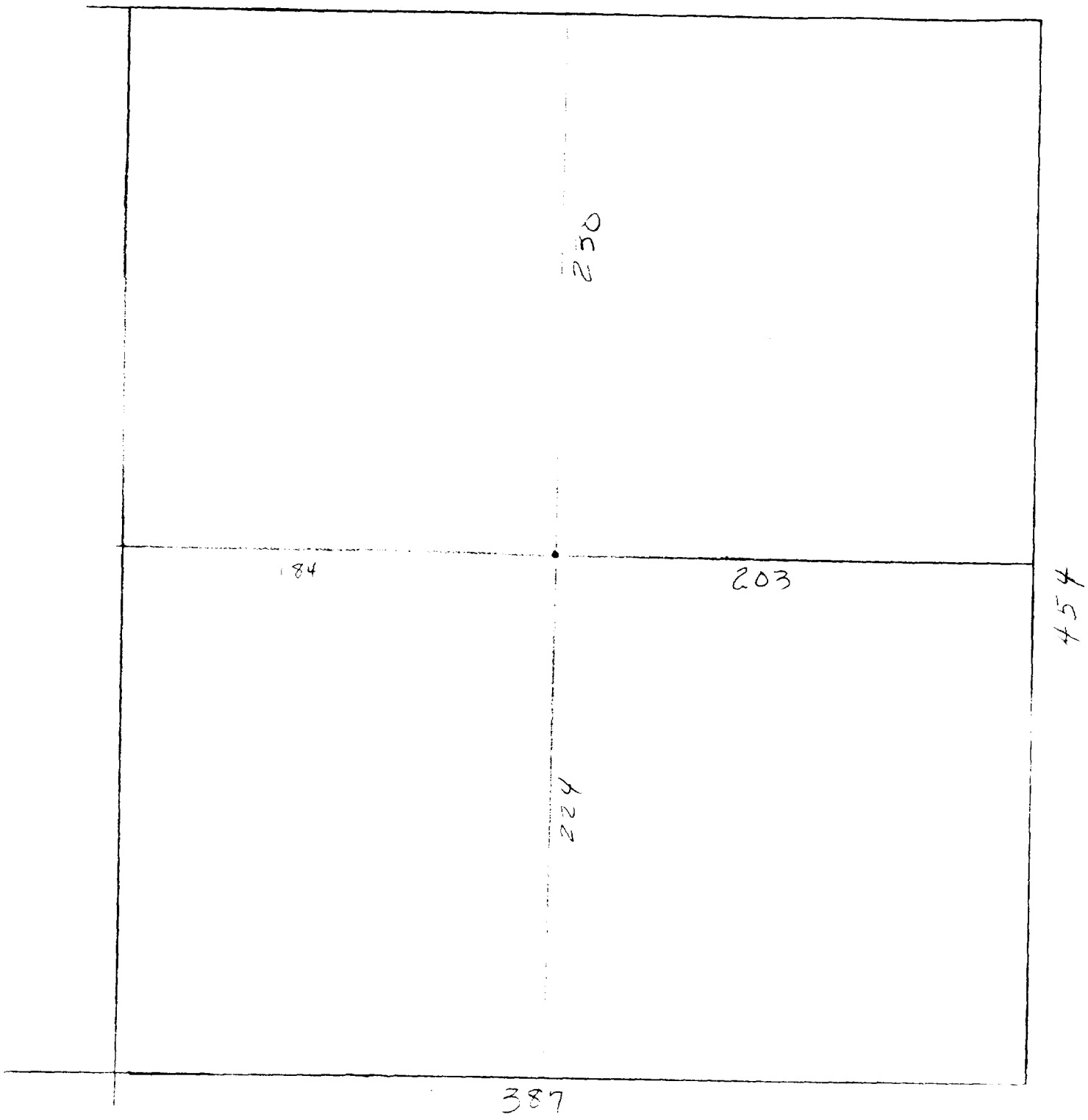

SITE NAME: CRAIG AFB Old Eng Bldg NUMBER:

MAP NAME: Sardis AI SCALE: 1:24,000 DATUM: 1927-1929

COORDINATES OF LOWER RIGHT HAND CORNER OF 2.5 MINUTE GRID

LATITUDE 32 ° 20 ' 00 " LONGITUDE 86 ° 57 ' 30 "

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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Water 279-3051
Groundwater 270-5631
Field Operations 272-8131
Laboratory 277-6718
Education/Outreach 213-4399

June 19, 1995

Mr. John D. Swanson
102 Church Street
Selma, AL 36702

Mr. Swanson:

On Wednesday, June 7th, Jake Hall and I, from the Alabama Department of Environmental Management/Special Projects Division visited the old Craig Air Force Base facility in order to sample three small piles of soil located directly to the left of an old abandoned shed on base to determine if a suspected hazardous substance (Cyclohexanone) had been deposited on site. We collected a total of four (04) boring samples ranging from 2.5 feet to 4.5 feet in depth and composited the sediments into one sample. We feel that due to the number of borings collected and to the small size of the sampled area, that this was a very good representative sample. Consequently, we have received the results of the sample and it confirmed that no detectable amount of cyclohexanone is located in this particular pile of soil. Therefore, the soil may be relocated on site without requiring the services of hazardous materials workers. The county may either spread the soil out at its current location, or select another section of Craig Air Force Base.

If you have any questions concerning the results of the sample, or any other environmental concern, please do not hesitate to call me a (334) 260-2777.

Sincerely,

Mr. Arnold P. Mayberry, PCS

ATTACHMENT 3

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May 23, 1995

Mr. John D. Friday
231 Highway 80 E.
Selma, AL 36701

Mr. Friday:

On Wednesday, April 26th, Jake Hall and I, from the Alabama Department of Environmental Management/Special Projects Division visited your facility in order to sample a 10' by 16' area of soil located directly to the right of your building, to determine if a suspected hazardous substance (Cyclohexanone) had been deposited on site. We dug a total of ten (10) boring samples ranging from 6 inches to a foot and a half in depth and composited the sediments into one sample. We feel that due to the number of borings collected and to the small size of the sampled area, that this was a very good representative sample. Consequently, we have received the results of the sample and it confirmed that no detectable amount of cyclohexanone is located at your facility. Therefore, we see no further problems with your future construction in the area.

If you have any questions concerning the results of the sample, or any other environmental concern, please do not hesitate to call me a (334) 260-2777.

Sincerely,

Mr. Arnold P. Mayberry, PCS

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December 8, 1993

TO: Jymalyn E. Redmond, Chief
Site Assessment Unit

FROM: Arnold P Mayberry, PCS
Site Assessment Unit

COPY

SUBJECT: Trip Report
Craig Air Force Base
Dallas County

On December 6, 1993, Jake Hall and I, investigated the closed military base (Craig AFB) in Selma, Alabama. Upon arrival, we spoke with Mr. G. E. Jones (Dallas County Engineer) and Mr. Dale Nielson (Acting Maintenance Supervisor). They informed us that the county owned a small portion of land located on base, in which, the county was cleaning up.

The area of land was the old Corp of Engineering buildings that had been demolished and waiting for removal. In the process of removing the debris, the bulldozer operator, Mr. Wayne Edwards, accidentally busted open one steel 55-gallon drum. The contents of the drum spilled in a small 8' x 16' area of soil. As the crew continued to remove the contaminated soil, eight people became ill, with one person having to go to the hospital. The men complained of dizziness, nausea, and eye irritation.

The drum is believed to have been left behind at base closing in 1977. Also, another drum was found in an abandoned building next door to the site. The drum was made of cardboard, was a 35-45 gallon container, and was 3/4 of the way filled with a white, powdery substance that was granular, like washing powder. A worker at the Craig Field Airport and Industrial Authority Office, said that he has worked with the substance in the paper drum container. He said the white substance was called Aokite. It was a compound used to prevent rust and scale on the inside of the fire engine tanks.

Debris from the buildings, along with the crushed drum, was taken to four other locations. The 1st dumpsite was a drainage ditch where the county used the dirt and debris to re-enforce the embankment. This is where the crushed drum is believed to be. The 2nd dumpsite was approximately 1 mile east of the first dump site, along Pistol Range Road. It contained mostly dirt, concrete blocks, metal, and several TNT shells.

The 3rd dumpsite was located 7.2 miles from the 2nd dump site, at Selmont Service Center on Hwy 80 (1 mile east of Edmond Pettus Bridge). It contained mostly concrete blocks, dirt, and a few metal scraps. Alabama Gas Co. and others have dumped at this location. The 4th dumpsite is located behind Wheeler Motor Company on Hwy 80, about .2 mile from 3rd dumpsite. It contained concrete, tires, metals, boxes, and recyclable plastic wood from possibly the Superwood of Alabama, Inc., located at 107 Ave C on Craig AFB.

The drum was removed from the site on Nov. 29, 1993. Mr. Haynes Kelly and Tom Williams of E.M.C., Inc.(Environmental Material Consultants), were present, taking a soil and compound sample. ADEM also took a soil and compound sample. ADEM then roped off all five locations with hazardous warning tape and told all parties involved, not to dump anything else in these locations until further notified.

ADEM

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Leigh Pegues, Director

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Guy Hunt
Governor

June 07, 1991 Selma

MEMORANDUM

TO: Dan Cooper, Chief
Special Projects

FROM: James Thomas, Hydrogeologist
Hydrogeology Unit

RE: Hydrogeology of the Area of the Cahaba Chemicals, SSI Facility #00009
Dallas County

On May 29, 1991, a site screening investigation was conducted at the site of Cahaba Chemicals located in Selma, Alabama. Clay Scott, Anthony Yarbrough and Chris Smith of ADEM's Field Operations Division were also present.

SURFACE WATER AND TOPOGRAPHY

The Cahaba Chemical Site is located in the north-west 1/4 of Section 31, Township 17 North, Range 11 East in east Selma approximately 0.35 miles north of the Alabama River (see Figure 1). Immediately south of the south of the site is a large draw which runs off the river. There is a wet weather stream located in the draw which at the time of our inspection was flowing. Surface drainage is to the south toward the draw. The slope is approximately 2 percent.

The topography in the immediate area of the site is flat to rolling and the area is not karst. The topographic elevation is located between 120 and 125 feet msl which is above the 100 year flood elevation.

SOILS

The site is underlain by soils of the Canton Bend-Urban land complex (Reeves, 1979). The Canton Bend-Urban land complex is composed of 40 to 65 percent Canton Bend soils and 15 to 40 % urban land. Urban land is the name given to soils that are located in areas where urban development has prevented soil mapping. The effective permeability of these soils, which falls into the range of $4.23X10^{-5}$ and $1.41X10^{-3}$ cm/sec, is very close to the permeability of the unsaturated zone, the area located between 5 feet below the surface and the water table, which is probably between $1X10^{-5}$ and $1X10^{-3}$ cm/sec (Freeze and Cherry, 1979).

Canton Bend soils are composed of brown to yellowish red loam, fine sandy loam, silty clay loam and clay loam. These soils formed in loamy and clayey sediments on terraces along major creeks and rivers where the slope is from 0 to 5 percent. The permeability is between $4.23X10^{-5}$ and $1.41X10^{-3}$ cm/sec.

GEOLOGY

The site is located in the Alluvial Plains district of Eastern Gulf Coastal Plain physiographic section (Mooty, 1987). The site is underlain by alluvial deposits of the Quaternary System, the Mooreville Chalk and the Eutaw Formation both of the Cretaceous System (Scott, Golden and Newton, 1981)(see Figures 3 & 4).

The alluvium consists of approximately 20 feet of unconsolidated sand, silt, clay and gravel. The Mooreville Chalk is composed of 400 to 420 feet of chalk, calcareous clay, sandy clay and limestone. The Mooreville Chalk dips to the south-southwest at approximately 40 feet per mile and in the area of the site is 25 to 40 feet thick.

The Eutaw Formation consists of three units. The upper unit is composed of greenish gray medium grained cross bedded glauconitic sand interbedded with olive gray to dark gray sandy clay and may be as thick as 150 feet. The middle unit consists of 50 to 150 feet of calcareous clay and sandy clay. The lower unit is composed of 30 to 50 feet of glauconitic sand interbedded with sandy clay. In the area of the site, the Eutaw Formation is approximately 410 feet thick.

GROUNDWATER

The major regional aquifer is located in the Eutaw Formation immediately below the Mooreville Chalk. The major groundwater production zones are located in the sand units beginning at approximately 270 feet beneath the site at approximately 150 feet below sea level. The Eutaw Aquifer may yield as much as one million gallons per day to individual wells. The gradient is to the south-southwest.

In the area of the site the alluvium is not an aquifer however groundwater was encountered on and near the site between 1 and 5 feet below the surface. This appears to be an upper saturated zone associated with the recent rain fall in the area.

GROUNDWATER USAGE

With in 4 miles of the site there are 8 public water supply wells and 2 industrial wells (see Figure 1). The public wells belong to the City of Selma and the North Dallas County Water and Fire Authority. These wells are between 412 and 963 feet deep and are screened in the Eutaw, Gordo and Coker Formations. The closest public wells are located 0.3 miles to the west.

Climate

The climate of the area is temperate with an average yearly rain fall of 52 inches (Reeves, 1979) and net yearly rainfall of 9 inches. The ten year minimum rainfall is 45 inches and the maximum is 60. The average daily maximum temperature is 78°F and the average daily minimum temperature is 55°. Maximum yearly temperatures exceed 100°F and minimum yearly temperatures are less than 15°.

REFERENCES

Mooty, Will S., 1987, Geohydrology and Susceptibility of Major Aquifers to Surface Contamination In Alabama; Area 7, U.S. Geological Survey Water Resources Investigations Report 87-4109

Scott, J. C., Golden, H. G. and Newton, J. G., 1981, Geology and Water Availability of Dallas County, Alabama, Geological Survey of Alabama County Map 180

Reeves, W. J., 1979, Soil Survey of Dallas County, Alabama, U. S. Department of Agriculture, Soil Conservation Service

GROUNDWATER MIGRATION PATHWAY

Route Characteristics

Depth to aquifer: 270 feet

Hydraulic Conductivity: $1X10^{-5}$ and $1X10^{-3}$ cm/sec.

Precipitation: 52 inches Gross
9 inches Net

Slope of land surface: 2 percent (max.)

Targets

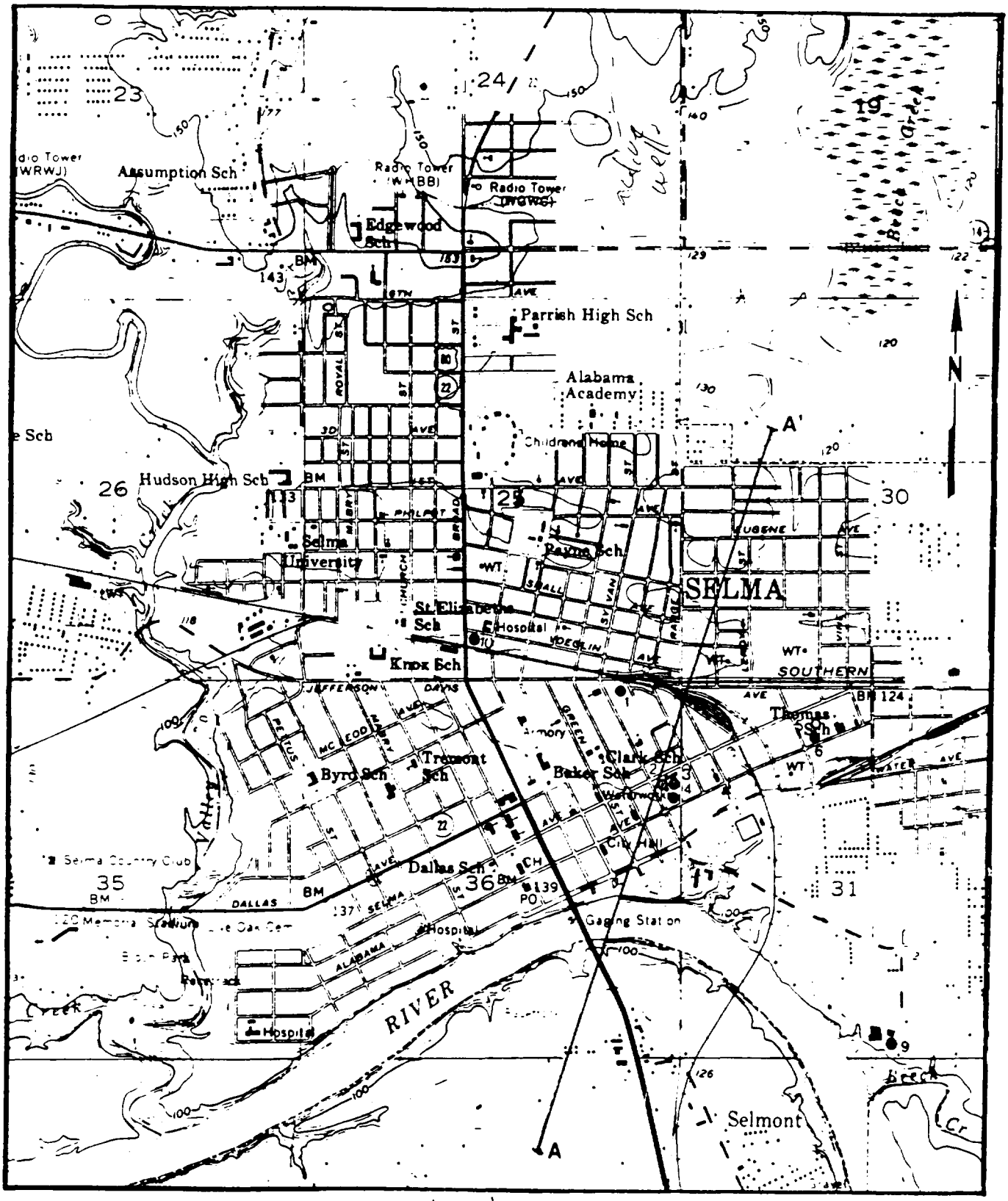
Groundwater Use: Public and industrial

Distance to Nearest well: 0.3 miles to the west

JET/pm

Water Supply Wells
Table 1

Well #	Owner	Remarks
1.	Selma Water Works	963 feet deep, Potentiometric surface located at +60 feet screened in the Coker Aquifer
2.	Selma Water Works	434 feet deep, 36 feet to water screened in the Eutaw Aquifer
3.	Selma Water Works	711 feet deep, Potentiometric surface located at +17 feet screened in the Gordo Aquifer
4.	Selma Water Works	434 feet deep, 26 feet to water screened in the Eutaw Aquifer
5.	Selma Water Works	695 feet deep, Potentiometric surface located at +15 feet. screened in the Gordo Aquifer.
6.	Selma Water Works	424 feet deep, screened in the. Eutaw Aquifer.
7.	North Dallas County Water & Fire	610 feet deep, 64 feet to water. screened in the Gordo Aquifer. located approx 3 miles north of the site. not included on Figure 1.
8.	North Dallas County Water & Fire	628 feet deep, 55 feet to water. screened in the Gordo Aquifer. located approx 3 miles north of the site. not included on Figure 1.
9.	R. L. Ziegler Co.	Industrial water supply well.
10	American Candy Manufacturing Company	Industrial water supply well.



Fim Arnold

Figure 1
Topography of the Area of the Cahaba Chemical Site

Site: □
Public Water Supply Well: ● ●
Industrial Water Supply Well: ●
Cross Section Area: A-A'

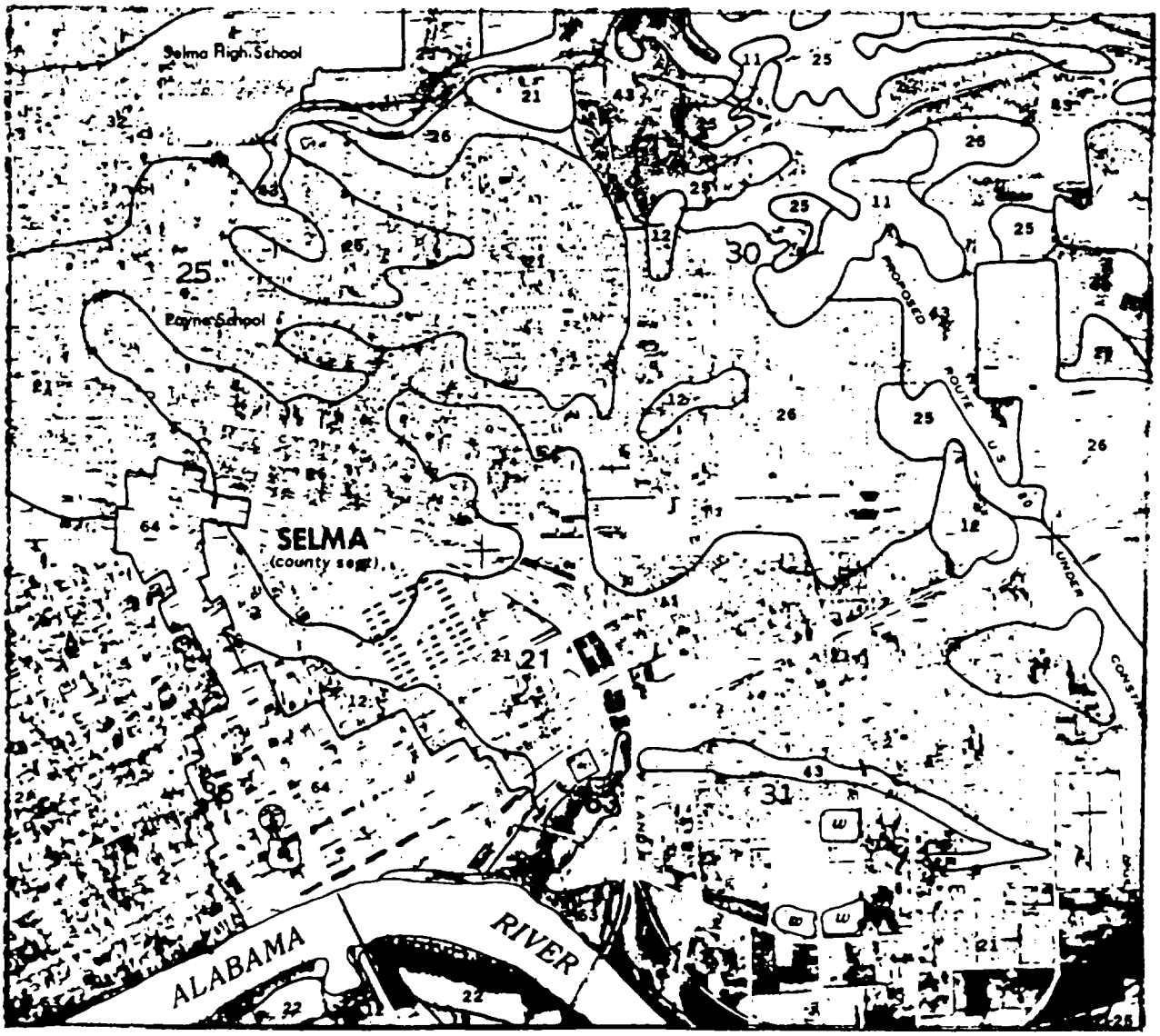


Figure 2
Soils Map of the Area of the Cahaba Chemical Site

Site: ☐
21: Canton Bend-Urban Land complex, 0 to 5 %.
63: Udifluvents, 4 to 25 % slopes, channeled.

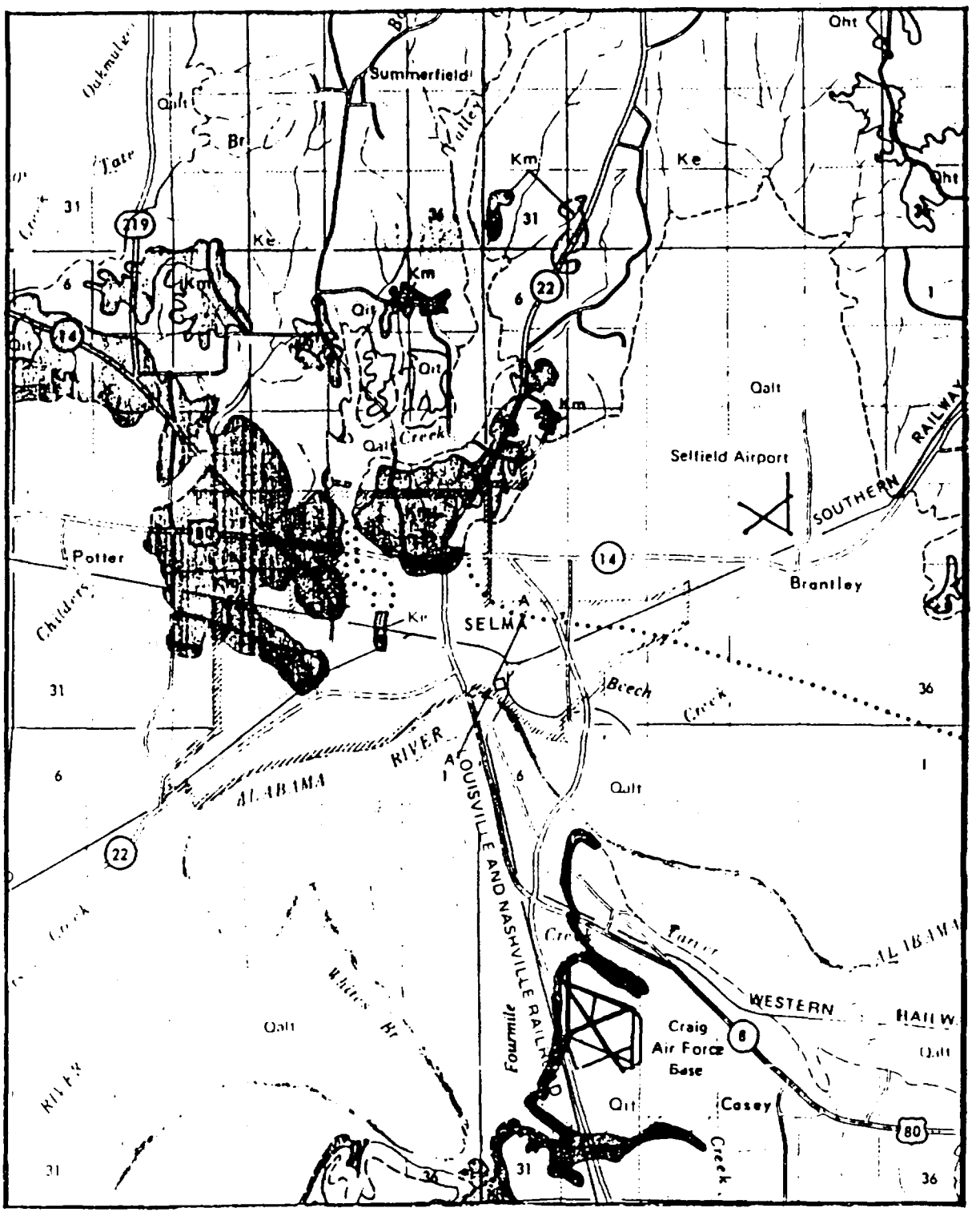


Figure 3
Geology of the Area of the Cahaba Chemical Site

Site: □
Qalt: Alluvium
Qit: Intermediate Terrace Deposits
Km: Mooreville Chalk
Ke: Eutaw Formation
A-A': Cross Section

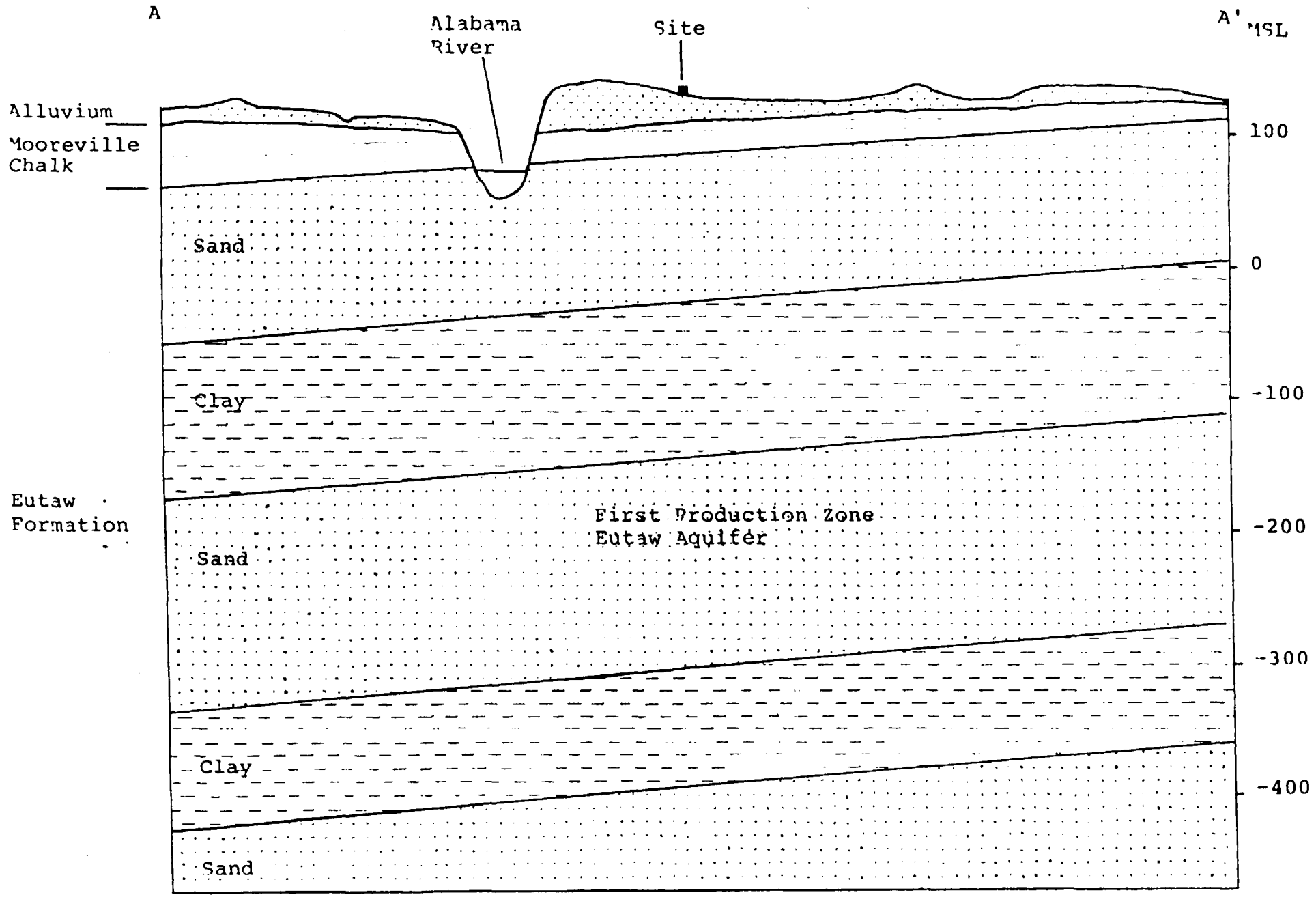


Figure 4
Geological Cross Section of the Area
of the Cahaba Chemical Site

OVERSIZED

DOCUMENT

ATTACHMENT 4

PRE-FINAL

VOLUME III
SAMPLING PLAN

FOR

REMEDIAL INVESTIGATION STUDY
FORMER CRAIG AIR FORCE BASE
SELMA, ALABAMA

Prepared For:

U.S. Army Corps of Engineers
Savannah District
P.O. Box 889
100 W. Oglethorpe Street
Savannah, Georgia 31402-0889

Prepared by:

Law Environmental, Inc.
Government Services Division
114 Town Park Drive
Kennesaw, Georgia

MARCH 1995

TABLE OF CONTENTS

1.0 INTRODUCTION AND BACKGROUND

The purpose of this Sampling Plan is to provide a description of the site and to detail the procedures that LAW will utilize while performing the Remedial Investigation at the former Craig Air Force Base.

1.1 ENVIRONMENTAL SETTING

This section generally describes the physiography, hydrogeology, water resources and climate of Craig Field as presented in the 1985 DERP Inventory Report and in the Water Availability Dallas County, Alabama 1981 document. This information was utilized in planning the field investigation.

1.1.1 Geologic Setting

Craig Field is situated in the Gulf Coastal Plain physiographic province. This province is divided into four physiographic subdivisions in Dallas County. These are the Central Pine Belt, the Black Prairie, the Chunnennuggee Hills and the terraces and flood plains. Craig Field lies almost entirely in the terraces and flood plains physiographic subdivision.

The terraces and flood plains subdivision consists mainly of the alluvium deposited by the Alabama River and its tributaries. This subdivision has been mapped as high terrace, intermediate terrace, low terrace and alluvium deposits. The soils vary in texture from gravely and coarse sands to silts and clays.

High terrace deposits form mesa-like plateaus in northeast and southeast Dallas County. The base of the deposits range from 300 to 400 feet in elevation (above mean sea level, National Geodetic Vertical Datum of 1929 amsl) and consists of yellowish-orange clay, silt, sand and gravel. Intermediate terrace deposits form relatively flat plains. Generally, the base ranges in elevation from 150 to 200 feet amsl. Yellowish-orange to reddish-brown sand and gravel are

the major constituents in this unit, but silt and clay are also present in appreciable quantities. Low terrace deposits and alluvium lie beneath flood plains and adjacent low lands of the Alabama River and its tributaries. This unit consists of yellowish-orange coarse-grained sand and gravel with some silt and clay content. From the Alabama River to the base of the intermediate deposits the elevation ranges from 150 to 200 feet amsl.

Beneath the terrace deposits and alluvium are Paleocene and upper Cretaceous sedimentary deposits of gravel, sand, silt, clay, limestone, sandstone and chalk. These deposits vary in thickness from 750 feet in north Dallas County to 2600 feet in the southern part. The formation names from the base of Cretaceous are: Coker Formation, Gordo Formation, Eutaw Formation, Mooreville Chalk, Demopolis Chalk, Ripley Formation, Prairie Bluff Formation and the Clayton Formation. These formations strike east-southeastward and dip south-southwestward. A generalized geologic cross-section of the area is present in Figure 1-1.

1.1.2 Ground Water

Aquifers in the Coker, Gordo, Eutaw and Ripley Formations yield adequate supplies of water for domestic and stock use. The surficial water table aquifer, in the terrace and alluvium deposits, has also been used for domestic use. Artesian aquifers in the Coker, Gordo and Eutaw Formations are the principal sources of water. The lower 100 feet of each unit are the most productive zones yielding as much as 1500 gallons per minute (gpm).

1.1.3 Surface Water

Two streams of significance drain the entire Craig Field complex. These are Four Mile Creek and Six Mile Creek. Four Mile Creek receives flow from Lake Craig, which drains the northern portion of Craig Field. Six Mile Creek drains the southern portion of the site. Both streams converge west of S.R. 41 and flow into the Alabama River.

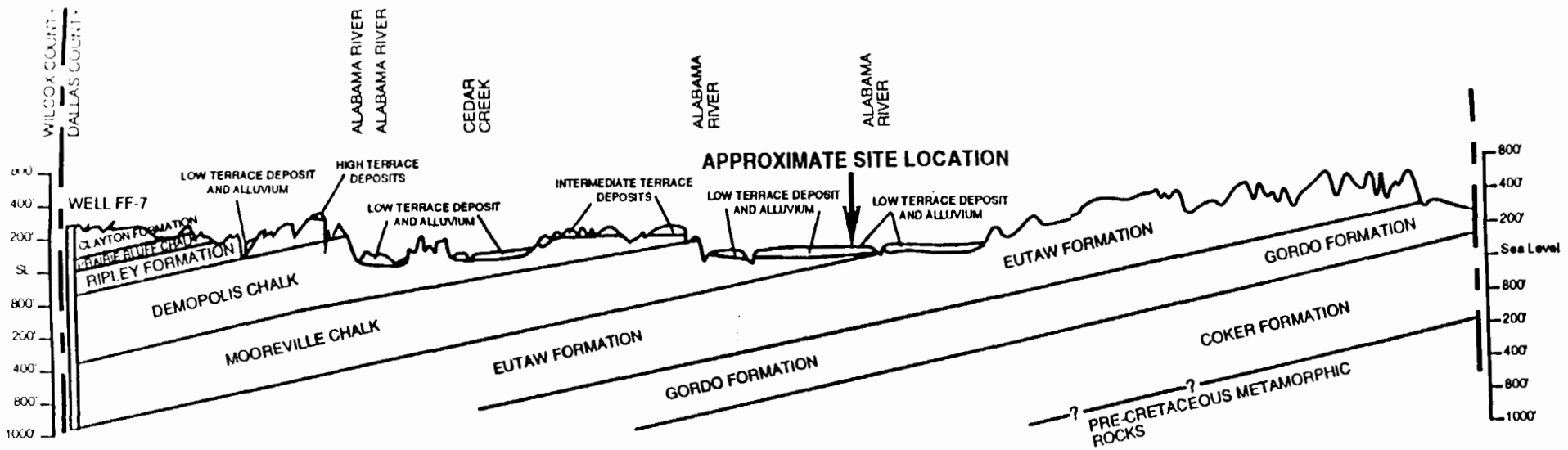
1.1.4 Topography

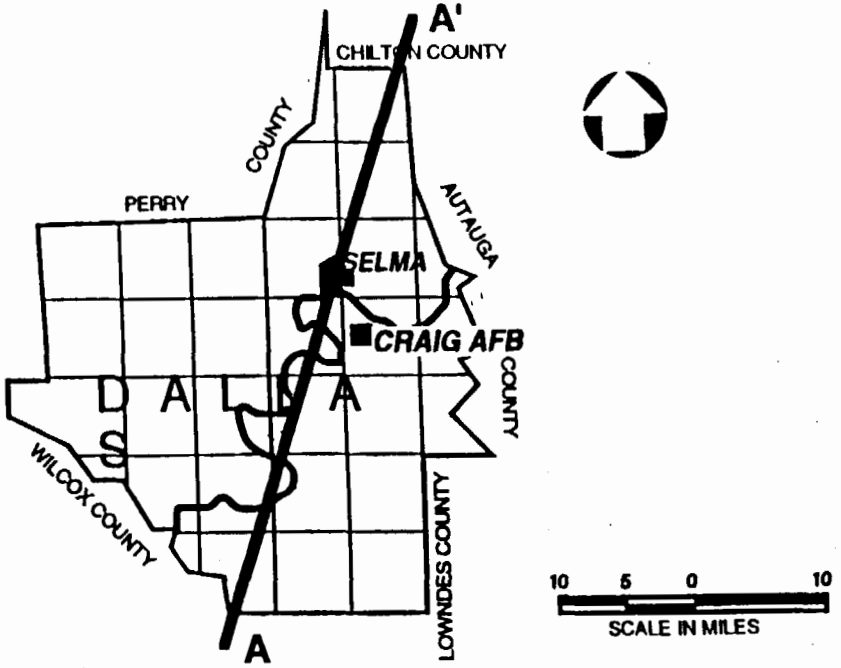
Topography in the vicinity of Craig Field ranges in elevation from a high of 200 feet amsl (slightly east of the site) to a low of approximately 115 amsl (northeast portion of the site). The terrain is somewhat hilly and is divided by streams draining to Four Mile Creek and Six Mile Creek.

1.1.5 Climate

Dallas County is mild and humid and receives about 52 inches annual precipitation. The average temperatures range from 51 degrees Fahrenheit in winter to 81 degrees Fahrenheit in summer.

GEOLOGIC CROSS SECTION





SOURCE: GEOLOGICAL SURVEY OF ALABAMA
"GEOLOGY AND WATER AVAILABILITY OF DALLAS COUNTY, ALABAMA", 1981

0598-0815.15

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
06/15/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

Attn: Dan Cooper

Lab number : 5106375
Sample number : 348-9130
Sample matrix : SOIL

Report Date: 06/15/95

COLLECTION INFORMATION
Date/Time/By: 07/07/95 12:20 MAYBERRY
Location : CRAIG AIR FORCE BASE SS-1

ADEM CENTRAL LABORATORY
- RESULTS REPORT - June 15, 1995

Lab#	Test	Result	Units	DL*	Analdate
5106375	1,1,1,2-Tetrachloroetha	0.0500	ug/g	U	06/09/95
	1,1,1-Trichloroethane	0.0500	ug/g	U	06/09/95
	1,1,2,2-Tetrachloroetha	0.0500	ug/g	U	06/09/95
	1,1,2Trichloroethane	0.0500	ug/g	U	06/09/95
	1,1-Dichloroethane	0.0500	ug/g	U	06/09/95
	1,1-Dichloroethylene	0.0500	ug/g	U	06/09/95
	1,1-Dichloropropene	0.0500	ug/g	U	06/09/95
	1,2,3-Trichlorobenzene	0.0500	ug/g	U	06/09/95
	1,2,3-Trichloropropane	0.0500	ug/g	U	06/09/95
	1,2,4-Trichlorobenzene	0.0500	ug/g	U	06/09/95
	1,2,4-Trimethylbenzene	0.0500	ug/g	U	06/09/95
	1,2-Dicholoethane	0.0500	ug/g	U	06/09/95
	1,2-Dichloropropane	0.0500	ug/g	U	06/09/95
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	1,3-Dichloropropane	0.0500	ug/g	U	06/09/95
	1,3-Dichloropropene	0.0500	ug/g	U	06/09/95
	2,2-Dichloropropane	0.0500	ug/g	U	06/09/95
	Tetrachloroethylene	0.0500	ug/g	U	06/09/95
	Bromobenzene	0.0500	ug/g	U	06/09/95
	Bromochloromethane	0.0500	ug/g	U	06/09/95
	Bromodichloromethane	0.0500	ug/g	U	06/09/95
	Benzene	0.0500	ug/g	U	06/09/95

JUN 1995 ADEM SPECIAL PROJECTS

JUN 1995 RECEIVED ADEM MONTGOMERY

COPY

* U denotes results less than the instrument detection limit.

ATTACHMENT 6

ADEM CENTRAL LABORATORY
- RESULTS REPORT - June 15, 1995

Lab#	Test	Result	Units	DL*	Analdate
5106375	Bromomethane	0.0500	ug/g	U	06/09/95
	cis-1,2-Dichloroethylen	0.0500	ug/g	U	06/09/95
	Chlorobenzene	0.0500	ug/g	U	06/09/95
	Chlorodibromomethane	0.0500	ug/g	U	06/09/95
	Chloroethane	0.0500	ug/g	U	06/09/95
	Bromoform	0.0500	ug/g	U	06/09/95
	Chloroform	0.0500	ug/g	U	06/09/95
	Chloromethane	0.0500	ug/g	U	06/09/95
	Carbon Tetrachloride	0.0500	ug/g	U	06/09/95
	Cyclohexanone in Soil	0.05	UG/G	U	06/09/95
	Dibromomethane	0.0500	ug/g	U	06/09/95
	Dichlorodifluoromethane	0.0500	ug/g	U	06/09/95
	Dichloromethane	0.0500	ug/g	U	06/09/95
	Ethylbenzene	0.0500	ug/g	U	06/09/95
	Fluorotrichloromethane	0.0500	ug/g	U	06/09/95
	Hexachlorobutadiene	0.0500	ug/g	U	06/09/95
	Isopropylbenzene	0.0500	ug/g	U	06/09/95
	m-Dichlorobenzene	0.0500	ug/g	U	06/09/95
	m+p-Xylene	0.0500	ug/g	U	06/09/95
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	n-Butylbenzene	0.0500	ug/g	U	06/09/95
	n-Propylbenzene	0.0500	ug/g	U	06/09/95
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	o-Dichlorobenzene	0.0500	ug/g	U	06/09/95
	o-Xylene	0.0500	ug/g	U	06/09/95
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	p-Isopropyltoluene	0.0500	ug/g	U	06/09/95
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	Styrene	0.0500	ug/g	U	06/09/95
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	Tertbutylbenzene	0.0500	ug/g	U	06/09/95
	Trichloroethylene	0.0500	ug/g	U	06/09/95
	Toluene	0.0500	ug/g	U	06/09/95
	Vinyl Chloride	0.0500	ug/g	U	06/09/95

* U denotes results less than the instrument detection limit.

- SAMPLE ANALYSIS REPORT -
02/28/94

To: DSMOA Special Projects
1890-AA Dickinson Drive
Montgomery AL 36109

Attn: Dan Cooper

Lab number : 4102062
Sample number : 535-5867
Sample matrix : SOIL

Report Date: 12/22/93

COLLECTION INFORMATION
Date/Time/By: 12/06/93 HALL
Location : CRAIG FIELD #1 SPILL

ADEM CENTRAL LABORATORY
- RESULTS REPORT - February 28, 1994

Lab#	Test	Result	Units	DL*	Analdate
4102062	Pyrene	0.33	ug/g	U	12/16/93
	1,3-Dichlorobenzene	0.33	ug/g	U	12/16/93
	Butyl benzyl phthalate	0.33	ug/g	U	12/16/93
	Benzidine	0.33	ug/g	U	12/16/93
	Anthracene	0.33	ug/g	U	12/16/93
	Dibutyl phthalate	0.33	ug/g	U	12/16/93
	Dimethylphthalate	0.33	ug/g	U	12/16/93
	Bis(2-chlorethyl)ether	0.33	ug/g	U	12/16/93
	4-Bromophenyl phenyl et	0.33	ug/g	U	12/16/93
	Hexachlorobenzene	0.33	ug/g	U	12/16/93
	Phenanthrene	0.33	ug/g	U	12/16/93
	2-Methyl-4,6-dinitrophe	1.65	ug/g	U	12/16/93
	Hexachlorobutadiene	0.33	ug/g	U	12/16/93
	Acenaphthylene	0.33	ug/g	U	12/16/93
	2-Chloronaphthalene	0.33	ug/g	U	12/16/93
	2,6-Dinitrotoluene	0.33	ug/g	U	12/16/93
	Acenaphthene	0.33	ug/g	U	12/16/93
	2,4-Dinitrotoluene	0.33	ug/g	U	12/16/93
	Fluorene	0.33	ug/g	U	12/16/93
	4-Chlorophenyl phenyl e	0.33	ug/g	U	12/16/93
	Fluoranthene	0.33	ug/g	U	12/16/93
	1,2-Diphenylhydrazine	0.33	ug/g	U	12/16/93

* U denotes results less than the instrument detection limit.

Lab#	Test	Result	Units	DL*	Analdate
4102062	2,4,6-Trichlorophenol	0.33	ug/g	U	12/16/93
	2,4-Dinitrophenol	3.30	ug/g	U	12/16/93
	4-Nitrophenol	0.33	ug/g	U	12/16/93
	1,2,4-Trichlorobenzene	0.33	ug/g	U	12/16/93
	Pentachlorophenol	0.33	ug/g	U	12/16/93
	Hexachlorocyclopentadie	0.33	ug/g	U	12/16/93
	Benzo(g,h,i)perylene	0.33	ug/g	U	12/16/93
	N-nitrosodimethylamine	0.33	ug/g	U	12/16/93
	1,4-Dichlorobenzene	0.33	ug/g	U	12/16/93
	2,3,7,8-Tetrachlorodibe	0.33	ug/g	U	12/16/93
	Benzo(a)anthracene	0.33	ug/g	U	12/16/93
	Chrysene	0.33	ug/g	U	12/16/93
	Dibenzo(a,h)anthracene	0.33	ug/g	U	12/16/93
	Nitrobenzene	0.33	ug/g	U	12/16/93
	Isophorone	0.33	ug/g	U	12/16/93
	Benzo(b)fluoranthene	0.33	ug/g	U	12/16/93
	Bis(2-chloroethoxy)meth	0.33	ug/g	U	12/16/93
	Benzo(a)pyrene	0.33	ug/g	U	12/16/93
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	Diethyl phthalate	0.33	ug/g	U	12/16/93
	N-nitrosodiphenylamine	0.33	ug/g	U	12/16/93
	Di-n-octyl phthalate	0.33	ug/g	U	12/16/93
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	2,4-Dimethylphenol	0.33	ug/g	U	12/16/93
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	Bis(2-ethylhexyl)phthal	0.33	ug/g	U	12/16/93
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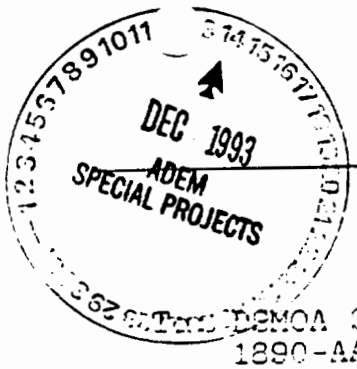
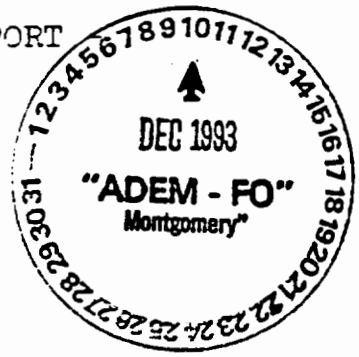
	Benzo(k)fluoranthene	0.33	ug/g	U	12/16/93
	4-Chloro-3-methylphenol	0.33	ug/g	U	12/16/93
	2,4-Dichlorophenol	0.33	ug/g	U	12/16/93
	1,2-Dichlorobenzene	0.33	ug/g	U	12/16/93
	Hexachloroethane	0.33	ug/g	U	12/16/93
	N-nitroso-di-n-propylam	0.33	ug/g	U	12/16/93

* U denotes results less than the instrument detection limit.

ADEM CENTRAL LABORATORY



- SAMPLE ANALYSIS REPORT
12/10/93



Trans DEMOA Special Projects
1890-AA Dickinson Drive
Montgomery AL 36109

Attn: Dan Cooper

Lab number : 4102063
Sample number : 535-5867
Sample matrix : SOIL

Report Date: 12/10/93

COLLECTION INFORMATION
Date/Time/By: 12/06/93 HALL
Location : CRAIG FIELD #2 SPILL

ADEM CENTRAL LABORATORY
- RESULTS REPORT - December 10, 1993

Lab#	Test	Result	Units	DL*	Analdate
4102063	1,1,1,2-Tetrachloroetha	0.0500	ug/g	U	12/07/93
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	1,1,2Trichloroethane	0.0500	ug/g	U	12/07/93
	1,1-Dichloroethane	0.0500	ug/g	U	12/07/93
	1,1-Dichloroethylene	0.0500	ug/g	U	12/07/93
	1,1-Dichloropropene	0.0500	ug/g	U	12/07/93
	1,2,3-Trichlorobenzene	0.0500	ug/g	U	12/07/93
	1,2.3-Trichloropropane	0.0500	ug/g	U	12/07/93
	1,2,4-Trichlorobenzene	0.0500	ug/g	U	12/07/93
	1,2,4-Trimethylbenzene	0.0500	ug/g	U	12/07/93
	1,2-Dicholoethane	0.0500	ug/g	U	12/07/93
	1,2-Dichloropropane	0.0500	ug/g	U	12/07/93
	1.3,5-Trimethylbenzene	0.0500	ug/g	U	12/07/93
	1.3-Dichloropropane	0.0500	ug/g	U	12/07/93
	1,3-Dichloropropene	0.0500	ug/g	U	12/07/93
	2,2-Dichloropropane	0.0500	ug/g	U	12/07/93
	Tetrachloroethylene	0.0500	ug/g	U	12/07/93
	Bromobenzene	0.0500	ug/g	U	12/07/93
	Bromochloromethane	0.0500	ug/g	U	12/07/93
	Bromodichloromethane	0.0500	ug/g	U	12/07/93
	Benzene	0.0500	ug/g	U	12/07/93

* denotes results less than the instrument detection limit.

- SAMPLE ANALYSIS REPORT -
02/28/94

To: DSMOA Special Projects
1890-AA Dickinson Drive
Montgomery AL 36109

Attn: Dan Cooper

Lab number : 4102063
Sample number : 535-5867
Sample matrix : SOIL

Report Date: 12/10/93

COLLECTION INFORMATION
Date/Time/By: 12/06/93 HALL
Location : CRAIG FIELD #2 SPILL

ADEM CENTRAL LABORATORY
- RESULTS REPORT - February 28, 1994

Lab#	Test	Result	Units	DL*	Analdate
4102063	p-Chlorotoluene	0.0500	ug/g	U	12/07/93
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	m-Dichlorobenzene	0.0500	ug/g	U	12/07/93
	1,1-Dichloroethane	0.0500	ug/g	U	12/07/93
	Dichloromethane	0.0500	ug/g	U	12/07/93
	cis-1,2-Dichloroethylen	0.0500	ug/g	U	12/07/93
	o-Chlorotoluene	0.0500	ug/g	U	12/07/93
	p-Dichlorobenzene	0.0500	ug/g	U	12/07/93
	Dibromomethane	0.0500	ug/g	U	12/07/93
	p-Isopropyltoluene	0.0500	ug/g	U	12/07/93
	o-Dichlorobenzene	0.0500	ug/g	U	12/07/93
	t-1,2-Dichloroethylene	0.0500	ug/g	U	12/07/93
	Secbutylbenzene	0.0500	ug/g	U	12/07/93
	Bromoform	0.0500	ug/g	U	12/07/93
	Bromomethane	0.0500	ug/g	U	12/07/93
	Chlorobenzene	0.0500	ug/g	U	12/07/93
	Chlorodibromomethane	0.0500	ug/g	U	12/07/93
	Chloroethane	0.0500	ug/g	U	12/07/93
	n-Propylbenzene	0.0500	ug/g	U	12/07/93
	Bromodichloromethane	0.0500	ug/g	U	12/07/93
	Fluorotrichloromethane	0.0500	ug/g	U	12/07/93
	Hexachlorobutadiene	0.0500	ug/g	U	12/07/93

* U denotes results less than the instrument detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - December 10, 1993

Lab#	Test	Result	Units	DL*	Analdate
4102068	Bromomethane	0.0500	ug/g	U	12/07/93
	cis-1,2-Dichloroethylen	0.0500	ug/g	U	12/07/93
	Chlorobenzene	0.0500	ug/g	U	12/07/93
	Chlorodibromomethane	0.0500	ug/g	U	12/07/93
	Chloroethane	0.0500	ug/g	U	12/07/93
	Bromoform	0.0500	ug/g	U	12/07/93
	Chloroform	0.0500	ug/g	U	12/07/93
	Chloromethane	0.0500	ug/g	U	12/07/93
	Carbon Tetrachloride	0.0500	ug/g	U	12/07/93
	Dibromomethane	0.0500	ug/g	U	12/07/93
	Dichlorofluoromethane	0.0500	ug/g	U	12/07/93
	Dichloromethane	0.0500	ug/g	U	12/07/93
	Ethylbenzene	0.0500	ug/g	U	12/07/93
	Fluorotrichloromethane	0.0500	ug/g	U	12/07/93
	Hexachlorobutadiene	0.0500	ug/g	U	12/07/93
	Isopropylbenzene	0.0500	ug/g	U	12/07/93
	m-Dichlorobenzene	0.0500	ug/g	U	12/07/93
	m+p-Xylene	0.0500	ug/g	U	12/07/93
	Naphthalene	0.0500	ug/g	U	12/07/93
	n-Butylbenzene	0.0500	ug/g	U	12/07/93
	n-Propylbenzene	0.0500	ug/g	U	12/07/93
	o-Chlorotoluene	0.0500	ug/g	U	12/07/93
	o-Dichlorobenzene	0.0500	ug/g	U	12/07/93
	o-Xylene	0.0500	ug/g	U	12/07/93
	p-Chlorotoluene	0.0500	ug/g	U	12/07/93
	p-Dichlorobenzene	0.0500	ug/g	U	12/07/93
	p-Isopropyltoluene	0.0500	ug/g	U	12/07/93
	Secbutylbenzene	0.0500	ug/g	U	12/07/93
	Styrene	0.0500	ug/g	U	12/07/93
	t-1,2-Dichloroethylene	0.0500	ug/g	U	12/07/93
	Tertbutylbenzene	0.0500	ug/g	U	12/07/93
	Trichloroethylene	0.0500	ug/g	U	12/07/93
	Toluene	0.0500	ug/g	U	12/07/93
	Vinyl Chloride	0.0500	ug/g	U	12/07/93

[illegible] than the instrument

ENVIRONMENTAL MATERIALS CONSULTANTS, INC.

TELEFAX COMMUNICATION

DATE: 3/28/94

THE FOLLOWING PAGES ARE BEING TELEFAXED TO:

COMPANY NAME: ADEM, SPECIAL PROJECTS

ATTENTION: JAKE HALL

TELEFAX # : 260-2795

SENT BY: HAYNES KELLEY

ENVIRONMENTAL-MATERIALS CONSULTANTS, INC.
MONTGOMERY, ALABAMA
TELEFAX # (205) 265-4043

NUMBER OF PAGES INCLUDING THIS PAGE: 7

Comments: _____

2027 CHESTNUT ST. • MONTGOMERY, ALABAMA 36106 • (205) 265-4000

TTL, Inc. PRACTICING IN THE GEOSCIENCES

3516 Greensboro Avenue • P.O. Drawer 1128 • Tuscaloosa, Alabama 35403 • Telephone 205-345-0816 • FAX 205-345-0992

Client:	Environmental Materials Consultants, Inc.
Sample Date:	December 8, 1993
Sample Type:	Soil
Sampled By:	Client
Sample Site:	Civil Engineering Facility Craig Air Force Base Selma, Alabama
Sample ID:	660/120893/S1
TTL Lab Number:	931209.64

TCLP
INORGANICS

CONTAMINANT	[MAXIMUM]	RESULTS[2]	DATE ANALYZED
Arsenic (D004)	5.0	<0.50	12-16-93
Barium (D005)	100.0	<1.00	12-23-93
Cadmium (D006)	1.0	<0.10	12-23-93
Chromium (D007)	5.0	<0.50	12-23-93
Lead (D008)	5.0	<0.20	12-23-93
Mercury (D009)	0.2	<0.10	12-28-93
Selenium (D010)	1.0	<0.10	12-16-93
Silver (D011)	5.0	<0.50	12-23-93

2 = Results are expressed in ppm

The sample was analyzed in accordance with 40 CFR, Part 261, et al.

tclp\emc.rpt-2

TTL, Inc. PRACTICING IN THE GEOSCIENCES

3516 Greensboro Avenue • P.O. Drawer 1128 • Tuscaloosa, Alabama 35403 • Telephone 205-345-0816 • FAX 205-345-0992

Client:	Environmental Materials Consultants, Inc.
Sample Date:	December 8, 1993
Date Analyzed:	December 16, 1993
Sample Type:	Soil
Sampled By:	Client
Sample Site:	Civil Engineering Facility Craig Air Force Base Selma, Alabama
Sample ID:	660/120893/S1
TTL Lab Number:	931209.64

TCLP
ZHE VOLATILE ORGANICS

CONTAMINANT	[MAXIMUM]	MDL_1	$RESULTS_2$
Benzene (D018)	0.5	0.10	<0.10
Carbon Tetrachloride (D019)	0.5	0.10	<0.10
Chlorobenzene (D021)	100.0	0.10	<0.10
Chloroform (D022)	6.0	0.10	<0.10
1,2-Dichloroethane (D028)	0.5	0.10	<0.10
1,1-Dichlorethylene (D029)	0.7	0.10	<0.10
Methyl Ethyl Ketone (D035)	200.0	1.0	<1.0
Tetrachloroethylene (D039)	0.7	0.10	<0.10
Trichloroethylene (D040)	0.5	0.10	<0.10
Vinyl Chloride (D043)	0.2	0.10	<0.10
1,4-Dichlorobenzene (D027)	7.5	0.10	<0.10

MDL_1 = Method Detection Limit

2 = Results are expressed in ppm

The sample was analyzed in accordance with 40 CFR Part 261, et al.

TTL, Inc. PRACTICING IN THE GEOSCIENCES

3516 Greensboro Avenue • P.O. Drawer 1128 • Tuscaloosa, Alabama 35403 • Telephone 205-345-0816 • FAX 205-345-0992

Client:	Environmental Materials Consultants, Inc.
Sample Date:	December 6, 1993
Date Analyzed:	December 19, 1993
Sample Type:	Soil
Sampled By:	Client
Sample Site:	Civil Engineering Facility Craig Air Force Base Selma, Alabama
Sample ID:	660/120893/S1
TTL Lab Number:	931209.64

TCLP
BN/A EXTRACTABLE ORGANICS

CONTAMINANT	[MAXIMUM]	MDL_1	$RESULTS_2$
o-Cresol (D023)	200.0	0.20	<0.20
m-Cresol (D024)	200.0	0.20	<0.20
p-Cresol (D026)	200.0	0.20	<0.20
Cresol (D026)	200.0	0.20	<0.20
2,4-Dinitrotoluene (D030)	0.13	0.20	<0.20
Hexachlorobenzene (D032)	0.13	0.20	<0.20
Hexachloro-1,3-butadiene (D033)	0.5	0.20	<0.20
Hexachloroethane (D034)	3.0	0.20	<0.20
Nitrobenzene (D036)	2.0	0.20	<0.20
Pentachlorophenol (D037)	100.0	0.20	<0.20
Pyridine (D038)	5.0	0.20	<0.20
2,4,5-Trichlorophenol (D041)	400.0	0.20	<0.20
2,4,6-Trichlorophenol (D042)	2.0	0.20	<0.20

MDL_1 = Method Detection Limit

2 = Results are expressed in ppm

The sample was analyzed in accordance with 40 CFR Part 261, et al.

tclp\emc.rpt-5

TTL, Inc. PRACTICING IN THE GEOSCIENCES

3516 Greensboro Avenue • P.O. Drawer 1128 • Tuscaloosa, Alabama 35403 • Telephone 205-345-0816 • FAX 205-345-0992

Client:	Environmental Materials Consultants, Inc.
Sample Date:	December 8, 1993
Date Analyzed:	December 16 & 21, 1993
Sample Type:	Soil
Sampled By:	Client
Sample Site:	Civil Engineering Facility Craig Air Force Base Selma, Alabama
Sample ID:	660/120893/S1
TTL Lab Number:	931209.64

TCLP PESTICIDES

CONTAMINANT	[MAXIMUM]	RESULTS[2]
Chlordane (D020)	0.03	<0.015
Endrin (D012)	0.02	<0.01
Heptachlor (D031)	0.008	<0.005
Heptachlor Epoxide	0.008	<0.005
Lindane (D013)	0.4	<0.2
Methoxychlor (D014)	10.0	<1.0
Toxaphene (D015)	0.5	<0.25

TCLP HERBICIDES

CONTAMINANT	[MAXIMUM]	RESULTS[2]
2,4-D(D016)	10.0	<5.0
2,4,5-TP (D017)	1.0	<0.5

2 = Results are expressed in ppm

The sample was analyzed in accordance with 40 CFR Part 261, et al.

tclp\emc.rpt-6

TTL, Inc. PRACTICING IN THE GEOSCIENCES

3516 Greensboro Avenue • P.O. Drawer 1128 • Tuscaloosa, Alabama 35403 • Telephone 205-345-0816 • FAX 205-345-0992

Client:	Environmental Materials Consultants, Inc.
Sample Date:	December 8, 1993
Sample Type:	Soil
Sampled By:	Client
Sample Site:	Civil Engineering Facility Craig Air Force Base Selma, Alabama
Sample ID:	660/120893/S1
TTL Lab Number:	931209.64

		Date Analyzed
pH, units	12.0	12-28-93
Flashpoint, pmcc °F	>180	12-23-93
Total Releasable HCN, mg/kg	<5.0	01-13-94
Total Releasable H_2S, mg/kg	<5.0	01-12-94

The sample was analyzed in accordance with methods outlined in Test Methods for Evaluating Solid Waste Physical/Chemical Methods, EPA, SW-846, 3rd Edition, November, 1986.

TTL, INC.

Chain of Custody Form

Sheet 1 of 1

Client: Environmental Materials Consultants, Inc

Mailing Address: 2027 Chestnut St. Montg, AL 36106

Contact: Haynes Kelly

Date: 12/8/93

Sampled By: Tom R. Williams

Sample Site: Civil Engineering Facility Craig AFB Selma, AL

TTL Job No.:

SAMPLE SECURITY REQUIREMENTS

1. Condition of Contents:
2. Sealed for Shipping By:
3. Initial Contents Temp.: °C Seal #
4. Sampling Status: Complete Expected Completion Date:
5. Custody Seal Intact Upon Receipt by Laboratory: Yes No
6. Condition of Contents:
7. Comments:

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	SAMPLE METHOD		# OF CONTAINERS	PRESERVATIVES	ANALYSIS PARAMETERS (REMARKS)
			SOLID, ETC.	GRAB	COMP			
12/8	2:30	660/120893/51	Soil	/		4		Complete TCLP Reactivity Corrosivity Flash point

CUSTODY TRANSFERS PRIOR TO SHIPPING

	Relinquished by: (signed)	Received by: (signed)	Date	Time
1	Tom R. Williams		12/8/93	4:00
2				
3				

SHIPPING DETAILS

Delivered to Shipper by:

Method of Shipment: Airbill #:

Received By Lab: James Jay

Date/Time: 12/9/93 11:43

TTL, Inc. - Tuscaloosa Office/Laboratory: 3516 Greensboro Avenue - Tuscaloosa, Alabama 35403 - Telephone (205) 345-0816 - FAX (205) 345-0992
TTL, Inc. - Montgomery Office: 4250 Lomac Street - Montgomery, Alabama 36106 - Telephone (205) 244-0766 - FAX (205) 244-6668

GEOLOGICAL SURVEY OF ALABAMA

Thomas J. Joiner
State Geologist

DIVISION OF WATER RESOURCES

Henry C. Barksdale
Chief

BULLETIN 113

7-DAY LOW FLOWS AND FLOW DURATION OF ALABAMA STREAMS THROUGH 1973

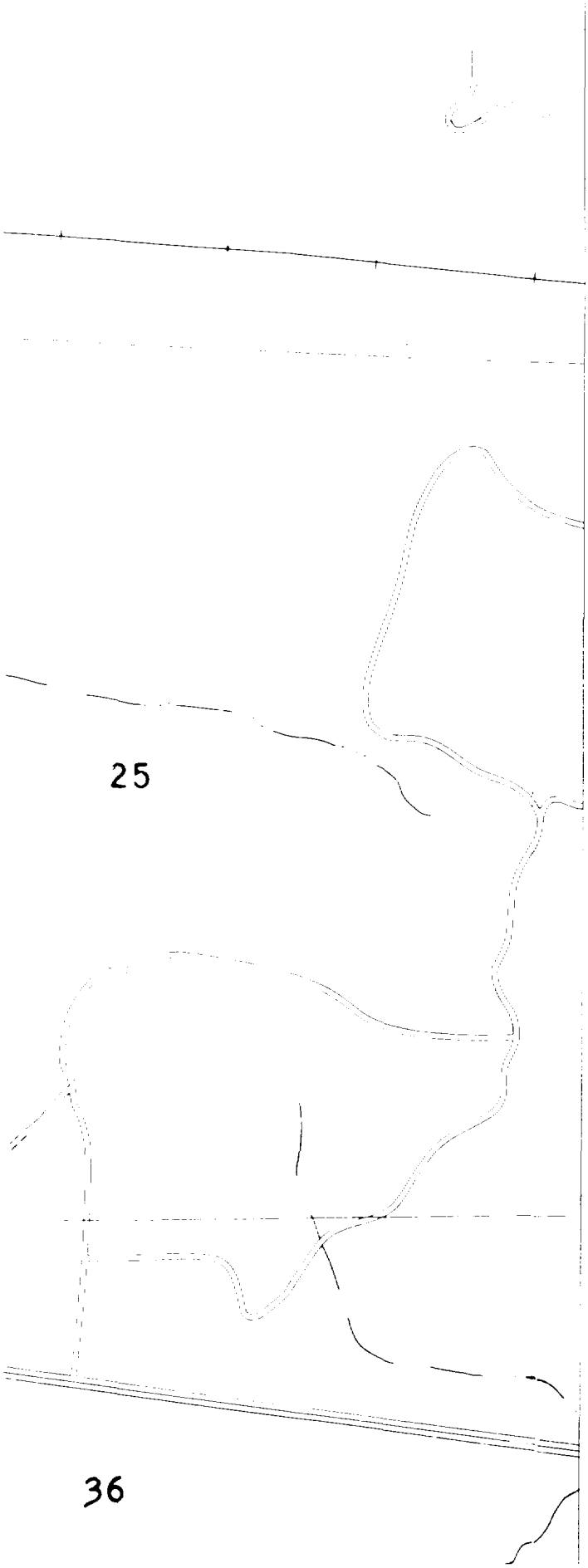
By

Eugene C. Hayes

Prepared by
United States Geological Survey
in cooperation with
Geological Survey of Alabama

University, Alabama
1978

Station no.	Stream and locality	Drainage area (sq mi)	Period of record (climatic years)	7-day average flow of period, in cfs, and year of occurrence	Estimated 10-year 7-day low flow in cfs and cfsm	Estimated 2-year 7-day low flow in cfs and cfsm	Location of gaging station
02416000	Tallapoosa River at Sturdivant, Ala.	2,460	1902-26	77.1 (1925)	250 .102	640 .260	In NE¼ sec. 8, T. 22 N., R. 22 E., 2,000 ft upstream from Central of Georgia Railway Bridge, and 1 mile west of Sturdivant, Tallapoosa County. Since 1926, site in backwater from Martin Dam.
02418500	Tallapoosa River below Tallassee, Ala.	3,320	1930-70	17.7 (1930)	136[11] .041	720[11] .217	In E½ sec. 30, T. 18 N., R. 22 E., 1½ miles downstream from State Highway 14 and Tallassee, Tallapoosa County, and 3½ miles upstream from Uphapee Creek.
02419000	Uphapee Creek near Tuskegee, Ala.	330	1941-71	1.3 (1954)	4.5 .014	16 .048	On east line of sec. 12, T. 17 N., R. 23 E., at State Highway 81, 1 mile upstream from Red Creek, and 4 miles north of Tuskegee, Macon County.
02419500	Tallapoosa River at Milstead, Ala.	3,750	1899-02	416 (1899)	—	—	In NW¼ sec. 19, T. 17 N., R. 22 E., at Birmingham & Southeastern Railroad Bridge at Milstead, Macon County, and 4 miles downstream from Uphapee Creek.
02420000	Alabama River near Montgomery, Ala.	15,100	1929-71	3,710 (1970)	5,120[11] 339	6,980[11] 462	In NW¼ sec. 31, T. 17 N., R. 17 E., at U. S. Highway 31, 4 miles upstream from Autauga Creek, and 6 miles northwest of Montgomery, Montgomery County.
			1929-60	4,480 (1941)	5,530[12] .366	7,270[12] .481	
			1962-71	3,710 (1970)	4,370[13] 289	6,220[13] .412	
02420500	Autauga Creek at Prattville, Ala.	109	1940-59	37.9 (1954)	47 .431	72 661	In N½ sec. 17, T. 17 N., R. 16 E., at Bridge Street in Prattville, Autauga County, and 5 miles upstream from mouth.
02421000	Catoma Creek near Montgomery, Ala.	298	1953-73	0.0 (1952) (1954) (1955) (1962)	0.0	0.5 .002	In sec. 6, T. 15 N., R. 18 E., at U. S. Highway 331, 5 miles south of Montgomery, Montgomery County, and 12 miles upstream from mouth.
02421300	Ivy Creek at Mulberry, Ala.	10.5	1962-65	1.7 (1963)	0.7 .067	2.4 .229	On N line of line between sections 16 and 17, T. 17 N., R. 13 E., at State Highway 14 at Mulberry, Autauga County, and 6 miles upstream from mouth.
02421500	Big Swamp Creek near Hayneville, Ala.	123	1940-45	0.0[14]	0.0	0.0	In sec. 19, T. 14 N., R. 15 E., at State Highway 21, 1 mile downstream from Fort Deposit Creek, and 1½ miles southwest of Hayneville, Lowndes County.
02422000	Big Swamp Creek near Lowndesboro, Ala.	247	1942-71	0.0[15]	0.0	0.2 .001	In NE¼ sec. 19, T. 15 N., R. 14 E., at U. S. Highway 80, 1 mile downstream from Panther Creek, and 5 miles west of Lowndesboro, Lowndes County.
02422500	Mulberry Creek at Jones, Ala.	208	1940-71	28.9 (1954)	45 .216	64 .308	In E½ sec. 31, T. 19 N., R. 12 E., at County Highway Bridge, 0.4 mile west of Jones, Autauga County, and 6 miles upstream from Buck Creek.
02423000	Alabama River at Selma, Ala.	17,100	1901-13 1930-70	3,300 (1904)	5,230[11] .306	7,540[11] .441	In SE¼ sec. 36, T. 17 N., R. 10 E., at U. S. Highway 80 in Selma, Dallas County, and 1 mile upstream from Valley Creek.



To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620

APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

DALLAS COUNTY

ALABAMA

(UNINCORPORATED AREAS)

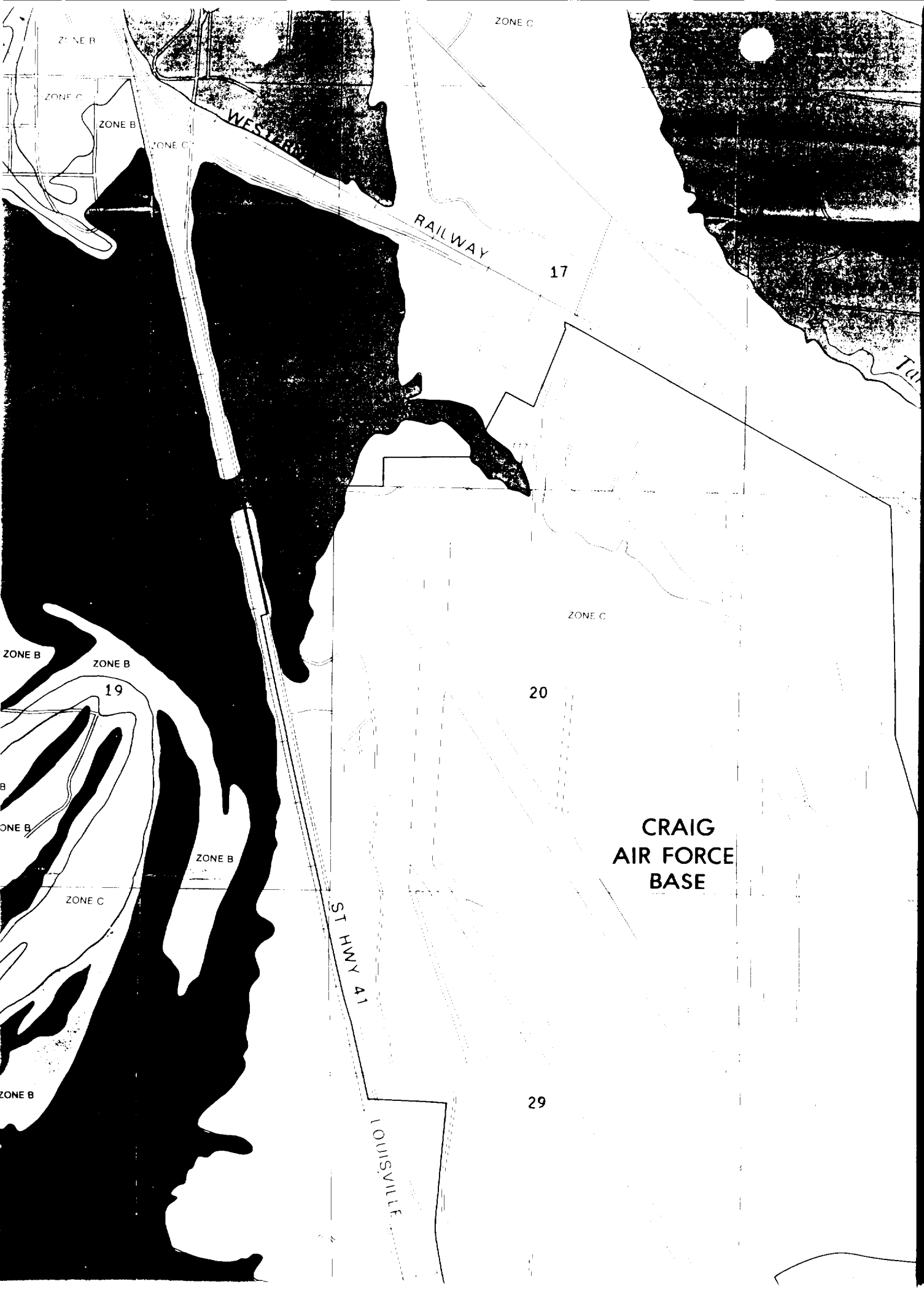
PANEL 105 OF 205

COMMUNITY-PANEL NUMBER

010063 0105 B

EFFECTIVE DATE:
SEPTEMBER 29, 1986

Federal Emergency Management Agency


ZONE B
ZONE C
ZONE B
ZONE C
WESTERN
RAILWAY
ZONE C
17
ZONE C
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19
20
ONE B
ZONE B
ZONE C
CRAIG
AIR FORCE
BASE
ST HWY 41
ZONE B
29
LOUISVILLE

ENDANGERED SPECIES BY COUNTY LIST

STATE: ALABAMA

	CERTAINTY OF OCCURRENCE	GROUP	STATUS
COUNTY: AUTAUGA			
BAT, INDIANA *(Myotis sodalis)*	POSSIBLE	MAMMAL	E
PITCHER-PLANT, ALABAMA CANEBREAK *(Sarracenia rubra ssp. alabamensis)*	KNOWN	PLANT	E
POTATO-BEAN, PRICES *(Apios priceana)*	KNOWN	PLANT	T
STORK, WOOD *(Mycteria americana)*	POSSIBLE	BIRD	E
COUNTY: BALDWIN			
EAGLE, BALD *(Haliaeetus leucocephalus)*	KNOWN	BIRD	E
MOUSE, ALABAMA BEACH *(Peromyscus polionotus ammobates)*	KNOWN	MAMMAL	ECH
MOUSE, PERDIDO KEY BEACH *(Peromyscus polionotus trissylepsis)*	KNOWN	MAMMAL	ECH
PLOVER, PIPING *(Charadrius melodus)*	KNOWN	BIRD	E
SNAKE, EASTERN INDIGO *(Drymarchon corais couperi)*	KNOWN	REPTILE	T
STORK, WOOD *(Mycteria americana)*	KNOWN	BIRD	E
STURGEON, GULF *(Acipenser oxyrchynchus desotoi)*	KNOWN	FISH	T
TURTLE, ALABAMA RED-BELLIED *(Pseudemys alabamensis)*	KNOWN	REPTILE	E
TURTLE, GREEN SEA *(Chelonia mydas)*	POSSIBLE	REPTILE	T
TURTLE, KEMP'S RIDLEY SEA *(Lepido chelys kempii)*	KNOWN	REPTILE	E
TURTLE, LOGGERHEAD SEA *(Caretta caretta)*	KNOWN	REPTILE	T
WOODPECKER, RED-COCKADED *(Picoides borealis)*	KNOWN	BIRD	E
COUNTY: BARBOUR			
BAT, INDIANA *(Myotis sodalis)*	POSSIBLE	MAMMAL	E
EAGLE, BALD *(Haliaeetus leucocephalus)*	KNOWN	BIRD	E
STORK, WOOD *(Mycteria americana)*	KNOWN	BIRD	E
COUNTY: BIBB			
BAT, INDIANA	POSSIBLE	MAMMAL	E

ENDANGERED SPECIES BY COUNTY LIST

STATE: ALABAMA

	CERTAINTY OF OCCURRENCE	GROUP	STATUS
COUNTY: CULLMAN			
BAT, INDIANA *(Myotis sodalis)*	POSSIBLE	MAMMAL	E
TURTLE, FLATTENED MUSK *(Sternotherus depressus)*	KNOWN	REPTILE	T
COUNTY: DALE			
BAT, INDIANA *(Myotis sodalis)*	POSSIBLE	MAMMAL	E
WOODPECKER, RED-COCKADED *(Picoides borealis)*	KNOWN	BIRD	E
COUNTY: DALLAS			
EAGLE, BALD *(Haliaeetus leucocephalus)*	KNOWN	BIRD	E
MUSSEL, FINE-LINED POCKETBOOK *(Lampsilis altilis)*	KNOWN	MUSSEL	T
MUSSEL, SOUTHERN CLUBSHELL *(Pleurobema decisum)*	KNOWN	MUSSEL	E
STORK, WOOD *(Mycteria americana)*	POSSIBLE	BIRD	E
WOODPECKER, RED-COCKADED *(Picoides borealis)*	KNOWN	BIRD	E
COUNTY: DEKALB			
BAT, GRAY *(Myotis grisescens)*	KNOWN	MAMMAL	E
BAT, INDIANA *(Myotis sodalis)*	POSSIBLE	MAMMAL	E
HARPERELLA *(Ptilimnium nodosum (=P. fluviatile))*	KNOWN	PLANT	E
PITCHER-PLANT, GREEN *(Sarracenia oreophila)*	KNOWN	PLANT	E
WATER-PLANTAIN, KRAL'S *(Sagittaria secundifolia)*	KNOWN	PLANT	T
COUNTY: ELMORE			
BAT, INDIANA *(Myotis sodalis)*	POSSIBLE	MAMMAL	E
EAGLE, BALD *(Haliaeetus leucocephalus)*	KNOWN	BIRD	E
MUSSEL, FINE-LINED POCKETBOOK *(Lampsilis altilis)*	KNOWN	MUSSEL	T
PITCHER-PLANT, ALABAMA CANEBRAKE	KNOWN	PLANT	E

Alabama Game and Fish Division

Department of Conservation and Natural Resources
64 North Union Street
Montgomery, Alabama 36130
Fax: (334) 242-3032

FAX TRANSMISSION COVER SHEET

Date: 6 August, 1997

TO: Mike Jones

FAX NO: (334) 271-7989 9-7050 (I'm an idiot)

FROM: Bob McCollum, Non-game Biologist

YOU SHOULD RECEIVE 11 PAGES, INCLUDING THIS COVER SHEET.
IF YOU DO NOT RECEIVE ALL PAGES, PLEASE CALL (334) 242-3867.

Dear Mike,

Enclosed are the state list of federally threatened and endangered species, the state non-game species regulation, and the state invertebrate species regulation. These lists are intended to help but are not a substitute for on site surveys to determine presence or absence of species. It is your responsibility to demonstrate the presence or absence of any of these species on the property in question. You will need a qualified consultant to conduct the survey of the property.

The Alabama Department of Conservation and Natural Resources, Natural Heritage Section maintains a database with locality occurrences and can be reached at 334/242-3484. The Alabama Natural Heritage Program maintains a database as well and can be reached at 334/834-4519.

Sincerely,

Bob

Bob McCollum, Non-game Biologist
Wildlife Section

ALABAMA

FEDERALLY LISTED ENDANGERED / THREATENED SPECIES

current as of ~~2 April~~ 8 Aug, 1997

TAXA	STATUS	COMMON / SCIENTIFIC NAMES	DISTRIBUTION
Mammals (7)		(See note on bottom of page 7)	
	E	Red wolf* *Canis rufus*	Extirpated
	E	Florida panther* *Felis concolor coryi*	Extirpated
	E	Gray bat *Myotis grisescens*	Tennessee Valley, Shelby and Conecuh Counties
	E CH	Indiana bat *Myotis sodalis*	Tennessee Valley, Jackson Coun
	E CH	Alabama beach mouse *Peromyscus polionotus ammobates*	Coastal, Baldwin county
	E CH	Perdido Key beach mouse *Peromyscus polionotus trissyllepsis*	Coastal, Baldwin county
	E CH	West Indian (Florida) manatee* *Trichechus manatus*	Coastal waters
Birds (8)			
	E	Ivory-billed woodpecker* *Campephilus principalis*	Extirpated
	T	Piping Plover *Charadrius melodus*	Coastal beaches and islands
	E CH	American peregrine falcon *Falco peregrinus anatum*	Statewide
	T	Bald Eagle *Haliaeetus leucocephalus*	Statewide
	E	Wood stork *Mycteria americana*	Statewide
	E	Eskimo curlew *Numenius borealis*	Possible migrant

TAXA	STATUS	COMMON / SCIENTIFIC NAMES	DISTRIBUTION
	E	Red-cockaded woodpecker *Picoides borealis*	Statewide
	E	Bachman's warbler* *Vermivora bachmanii*	Probably extirpated
Reptiles (10)	T (SA)	American Alligator *Alligator mississippiensis*	Southern half of the state
	T	Loggerhead sea turtle *Caretta caretta*	Coastal waters, nests on Alabama beaches
	T	Green sea turtle *Chelonia mydas*	Coastal waters, nests on Alabama beaches
	E CH	Leatherback sea turtle *Dermochelys coriacea*	Coastal waters
	T	Eastern indigo snake *Drymarchon corais couperi*	Extreme southern counties
	E CH	Hawksbill sea turtle *Eretmochelys imbricata*	Coastal waters
	T	Gopher tortoise *Gopherus polyphemus*	Choctaw, Mobile, and Washington Counties (western population only is listed)
	E	Kemp's (Atlantic) Ridley sea turtle *Lepidochelys kempii*	Coastal waters
	E	Alabama red-bellied turtle *Pseudemys alabamensis*	Mobile, Baldwin, and Monroe Counties
	T	Flattened musk turtle *Sternotherus depressus*	Upper Black Warrior River system
Amphibians (1)	T	Red Hills salamander *Phaeognathus hubrichti*	Butler, Crenshaw, Conecuh, Covington and Monroe Counties
Fish (12)	T	Gulf sturgeon *Acipenser oxyrhynchus desotoi*	Alabama, Mobile, Conecuh and Choctawhatchee Rivers

TAXA	ST. US	COMMON / SCIENTIFIC NAMES	DIST. BUTION
	T	Pygmy sculpin *Cottus pygmaeus*	Calhoun County
	T	Blue shiner *Cyprinella caerulea*	Coosa River: Cherokee, Calhoun Talladega, Coosa Counties
	T CH	Spotfin chub *Cyprinella monacha*	Tennessee River: Lauderdale an Colbert Counties
	T CH	Slackwater darter *Etheostoma boschungi*	Tennessee River: Madison, Lauderdale, and Limestone Counties
	E	Watercress darter *Etheostoma nuchale*	Jefferson County
	E	Boulder darter *Etheostoma wapiti*	Elk River: Limestone County
	E	Cahaba shiner *Notropis cahabae*	Cahaba River: Bibb County
	E	Palezone shiner *Notropis albizonatus*	Paint Rock River: Jackson Coun
	T	Goldline darter *Percina aurolineata*	Cahaba River system: Bibb and Shelby Counties
	T	Snail darter *Percina tanasi*	Paint Rock River: Jackson Coun
	E CH	Alabama cavefish *Speoplatyrhinus poulsoni*	Lauderdale County
Mollusks (38)	E	Anthony's riversnail *Anthearnia anthonyi*	Limestone Creek and Tennessee River: Limestone County
	E	Fanshell mussel *Cyprogenia stegaria*	Tennessee River
	E	Dromedary pearly mussel *Dromus dromas*	Tennessee River
	E	Yellow-blossom pearly mussel *Epioblasma florentina florentina*	Tennessee River

TAXA	STATUS	COMMON / SCIENTIFIC NAMES	DISTRIBUTION
	E	Upland combshell mussel *Epioblasma metastriata*	Black Warrior, Cahaba and Coosa River drainages
	E	Purple cat's paw pearly mussel *Epioblasma obliquata obliquata*	Tennessee River
	E	Southern acornshell mussel *Epioblasma othcaloogenesis*	Upper Coosa and Cahaba River drainages
	E	Southern combshell mussel *Epioblasma penita*	Tombigbee River, Buttahatchie River
	E	Tubercled-blossom pearly mussel Epioblasma torulosa torulosa	Tennessee River
	E	Turgid-blossom pearly mussel *Epioblasma turgidula*	Tennessee River
	E	Fine-rayed pigtoe mussel *Fusconaia cuneolus*	Paint Rock River
	E	Shiny pigtoe mussel *Fusconaia cor* (=*edgariana*)	Paint Rock River
	E	Cracking pearly mussel *Hemistena lata*	Tennessee River
	T	Fine-lined pocketbook mussel *Lampsilis altilis*	Coosa, Tallapoosa, and Cahaba drainages
	E	Pink mucket pearly mussel *Lampsilis abrupta*	Tennessee River, Paint Rock Riv
	T	Orange-nacre mucket *Lampsilis perovalis*	Tombigbee, Black Warrior, Alabama, and Cahaba drainages
	E	Alabama lamp pearly mussel *Lampsilis virescens*	Paint Rock River, Hurricane Creek
	T	Alabama moccasinshell mussel *Medionidus acutissimus*	Alabama, Tombigbee, Cahaba, Coosa, Black Warrior drainages
	E	Coosa moccasinshell mussel *Medionidus parvulus*	Coosa, Cahaba, and Black Warri drainages

TAXA	STATUS	COMMON / SCIENTIFIC NAMES	DISTRIBUTION
	E	Ring pink mussel *Obovaria retusa*	Tennessee River
	E	Little-wing pearly mussel *Pegias fabula*	Tennessee River
	E	White wartyback pearly mussel *Plethobasus cicatricosus*	Tennessee River
	E	Orange-footed pearly mussel *Plethobasus cooperianus*	Tennessee River
	E	Clubshell *Pleurobema clava*	Tennessee River drainage
	E	Black clubshell mussel* *Pleurobema curtum*	Extirpated
	E	Southern clubshell mussel *Pleurobema decisum*	Tombigbee, Black Warrior, Alabama, Tallapoosa and Coosa drainages
	E	Dark pigtoe mussel *Pleurobema furvum*	Sipsey Fork and North River drainages of Black Warrior River drainage
	E	Southern pigtoe mussel *Pleurobema georgianum*	Coosa River drainage
	E	Flat pigtoe mussel *Pleurobema marshalli*	Tombigbee River
	E	Ovate clubshell mussel *Pleurobema perovatum*	Tombigbee, Black Warrior, Alabama, Tallapoosa and Coosa drainages
	E	Rough pigtoe mussel *Pleurobema plenum*	Tennessee River
	E	Heavy pigtoe mussel *Pleurobema taitianum*	Tombigbee and Sipsey Rivers
	T	Inflated heelsplitter mussel *Potamilus inflatus*	Black Warrior and Tombigbee Rivers
	E	Triangular kidneyshell mussel *Ptychobranchus greeni*	Black Warrior, Cahaba, and Coos River drainages

TAXA	STATUS	COMMON / SCIENTIFIC NAMES	DISTRIBUTION
	E	Cumberland monkeyface pearly mussel *Quadrula intermedia*	Tennessee River
	E	Stirrup shell mussel *Quadrula stapes*	Tombigbee River, Sipsey River
	E	Pale lilliput pearly mussel *Toxolasma cylindrellus*	Paint Rock River, Hurricane Creek
	E	Tulotoma snail *Tulotoma magnifica*	several tributaries of the Coosa River system
Crustacea (1)	E	Alabama cave shrimp *Palaemonias alabamae*	Madison County
Insecta (1)	E	American burying beetle *Nicrophorus americanus*	Statewide
Plants (19)	T	Little amphianthus *Amphianthus pusillus*	Chambers and Randolph Counti
	T	Price's potato-bean *Apios priceana*	Autauga, Madison and Marshal Counties
	E	Rock cress *Arabis perstellata* var. *perstellata*	Bibb County
	E	Morefield's leather flower *Clematis morefieldii*	Madison County
	E	Alabama leather flower *Clematis socialis*	St. Clair and Cherokee Counties
	E	Leafy prairie-clover *Dalea foliosa*	Colbert, Franklin, Morgan, Lawrence, Jefferson Counties
	E	Gentian pinkroot *Spigelia gentianoides*	Bibb County
	T	Lyrate bladder-pod *Lesquerella lyrata*	Colbert, Franklin and Lawrence Counties

TAXA	STATUS	COMMON / SCIENTIFIC NAMES	DISTRIBUTION
	E	Pondberry *Lindera melissifolia*	Wilcox County
	T	Mohr's Barbara's buttons *Marshallia mohrii*	Bibb, Calhoun, Cherokee, Cullman, Walker, Etowah Counties
	T	American hart's-tongue fern *Asplenium scolopendrium* var. *americanum*	Morgan and Jackson Counties
	E	Harperella *Ptilimnium nodosum*	Cherokee, DeKalb and Tuscaloosa Counties
	T	Kral's water-plantain *Sagittaria secundifolia*	Cherokee, DeKalb and Winston Counties
	E	Green pitcher plant *Sarracenia oreophila*	Cherokee, DeKalb, Etowah, Jackson, and Marshall Counties
	E	Alabama canebrake pitcher-plant *Sarracenia rubra alabamensis*	Autauga, Chilton, Elmore Counties
	E	American chaffseed *Schwalbea americana*	Mobile, Baldwin, Geneva Counties
	T	Alabama streak-sorus fern *Thelypteris pilosa* var. *alabamensis*	Winston County
	E	Relict trillium *Trillium reliquum*	Henry, Lee, Bullock Counties
	E	Tennessee yellow-eyed grass *Xyris tennesseensis*	Bibb, Calhoun and Franklin Counties

Total Animal Species: 78, not including 5 species of whales
Total Plant Species: 19

Status:
- * = Not believed to occur in Alabama
- E = Endangered
- T = Threatened
- T(SA) = Threatened because of Similarity of Appearance
- CH = Critical Habitat has been designated

NOTE: There are 5 endangered species of whales found in coastal waters of the southeastern states. These include the finback whale *Balaenoptera physalus*, the humpback whale *Megaptera novaeangliae*, the right whale *Balaena glacialis*, the sei whale *Balaenoptera borealis*, and the sperm whale *Physeter catodon*. It is possible, though unlikely, that they could appear in Alabama coastal waters.

ALABAMA

220-2-.92 Non-game Species Regulation

(1) It shall be unlawful to take, capture, kill, or attempt to take, capture or kill, possess, sell, trade for anything of monetary value, or offer to sell or trade for anything of monetary value, the following non-game wildlife species (or any parts or reproductive products of such species) without a scientific collection permit or written permit from the Commissioner, Department of Conservation and Natural Resources, which shall specifically state what the permittee may do with regard to said species.

(a) FISHES

Common Name	*Scientific Name*
• Cavefish, Alabama	Speoplatyrhinus poulsoni
• Cavefish, Southern	Typhlichthys subterraneus
• Chub, Spotfin	Cyprinella monacha
• Darter, Boulder	Etheostoma wapiti
• Darter, Coldwater	Etheostoma ditrema
• Darter, Crystal	Crystallaria asprella
• Darter, Goldline	Percina aurolineata
• Darter, Slackwater	Etheostoma boschungi
• Darter, Snail	Percina tanasi
• Darter, Tuscumbia	Etheostoma tuscumbia
• Darter, Watercress	Etheostoma nuchale
• Madtom, Frecklebelly	Noturus munitus
• Sculpin, Pygmy	Cottus pygmaeus
• Shiner, Blue	Cyprinella caerulea
• Shiner, Cahaba	Notropis cahabae
• Shiner, Palezone	Notropis albinotus

(b) AMPHIBIANS

Common Name	*Scientific Name*
• Frog, Dusky Gopher	Rana capito sevosa
• Hellbender, Eastern	Cryptobranchus alleganiensis alleganiensis
• Salamander, Flatwoods	Ambystoma cingulatum
• Salamander, Green	Aneides aeneus
• Salamander, Red Hills	Phaeognathus hubrichti
• Salamander, Seal	Desmognathus monticola (of Coastal Plain origin)
• Salamander, Tennessee Cave	Gyrinophilus palleucus
• Treefrog, Pine Barrens	Hyla andersonii

(c) REPTILES

Common Name	*Scientific Name*
• Coachwhip, Eastern	Masticophis flagellum flagellum
• Snake, Black Pine	Pituophis melanoleucus lodingi
• Snake, Eastern Indigo	Drymarchon corais couperi
• Snake, Florida Pine	Pituophis melanoleucus mugitus
• Snake, Gulf Salt Marsh	Nerodia fasciata clarki
• Snake, Southern Hognose	Heterodon simus
• Terrapin, Mississippi Diamondback	Malaclemys terrapin pileata
• Tortoise, Gopher	Gopherus polyphemus
• Turtle, Alabama Map	Graptemys pulchra
• Turtle, Alabama Red-bellied	Pseudemys alabamensis
• Turtle, Alligator Snapping	Macroclemys temminckii
• Turtle, Barbour's Map	Graptemys barbouri

(d) BIRDS

Common Name	*Scientific Name*
• Crane, Mississippi Sandhill	Grus canadensis pulla
• Dove, Common Ground	Columbina passerina
• Eagle, Bald	Haliaeetus leucocephalus
• Eagle, Golden	Aquila chrysaetos
• Egret, Reddish	Egretta rufescens
• Falcon, Peregrine	Falco peregrinus
• Hawk, Cooper's	Accipiter cooperi
• Merlin	Falco columbarius
• Osprey	Pandion haliaetus
• Oystercatcher, American	Haematopus palliatus
• Pelican, American White	Pelecanus erythrorhynchos
• Plover, Piping	Charadrius melodus
• Plover, Snowy	Charadrius alexandrinus
• Plover, Wilson's	Charadrius wilsonia
• Stork, Wood	Mycteria americana
• Tern, Gull-billed	Sterna nilotica
• Warbler, Bachman's	Vermivora bachmani
• Woodpecker, Red-cockaded	Picoides borealis
• Wren, Bewick's	Thryomanes bewickii

(e) MAMMALS

• *Common Name*	*Scientific Name*
• Bat, Gray Myotis	Myotis grisescens
• Bat, Indiana	Myotis sodalis
• Bat, Rafinesque's Big-eared	Plecotus rafinesquii
• Bat, Southeastern	Myotis austroriparius
• Gopher, Southeastern Pocket	Geomys pinetis
• Mouse, Alabama Beach	Peromyscus polionotus ammobates
• Mouse, Meadow Jumping	Zapus hudsonius
• Mouse, Perdido Key Beach	Peromyscus polionotus trissyllepsis
• Weasel, Long-tailed	Mustela frenata

(f) Other State or Federally protected non-game species

In addition any required federal permits for federally protected species must be obtained.

(2) It shall be unlawful to collect or offer for sale, sell, or trade for anything of value any box turtle (Terrapene carolina), box turtle part or reproductive product except by permit as outlined in paragraph (1).

(3) It shall be unlawful to collect, harvest, possess, offer for sale, sell or trade for anything of monetary value any common snapping turtle (Chelydra serpentina serpentina) or soft shell turtles (Apalone ferox, Apalone muticus muticus, Apalone muticus calvatus, Apalone spinifera spinifera, Apalone spinifera aspera) with a carapace length less than eight inches. (Except any species protected under this paragraph taken in a live trap by a pond owner or his agent while controlling nuisance animals is exempt but may not be sold or offered for sale or traded for anything of monetary value.)

(4) Informational Note. See Section 9-11-269, Code of Alabama 1975, relating to protection of the flattened musk turtle (Sternotherus minor depressus).

220-2-.98 Invertebrate Species Regulation

(1) It shall be unlawful to take, capture, kill, or attempt to take, capture or kill; possess, sell, trade for anything of monetary value, or offer to sell or trade for anything of monetary value, the following invertebrate species (or any parts or reproductive products of such species) without a scientific collection permit or written permit from the Commissioner, Department of Conservation and Natural Resources, which shall specifically state what the permittee may do with regard to said species:

(a) Common Name	Scientific Name
Alabama cave shrimp	Palaemonias alabamae
Alabama lamp pearly mussel	Lampsilis virescens
Cracking pearly mussel	Hemistena lata
Cumberland monkeyface pearly mussel	Quadrula intermedia
Curtis' mussel	Epioblasma florentina curtisi
Fine-rayed pigtoe	Fusconaia cuneolus
Inflated heel splitter	Potaminus inflattus
Judge Tait's mussel	Pleurobema taitianum
Little-wing pearly mussel	Pegias fabula
Marshall's mussel	Pleurobema marshalli
Orange-footed pearly mussel	Plethobasus cooperianus
Pale lilliput pearly mussel	Toxolasma cylindrellus
Penitent mussel	Epioblasma penita
Pink mucket pearly mussel	Lampsilis orbiculata
Ring pink pearly mussel	Obovaria retusa
Shiny pigtoe	Fusconaia edgariana
Stirrup shell	Quadrula stapes
Turgid-blossom pearly mussel	Epioblasma turgidula
White wartyback pearly mussel	Plethobasus cicatricosus
Yellow-blossom pearly mussel	Epioblasma florentina florentina

(b) Other State or Federally protected invertebrate species.

In addition any required federal permits for federally protected species must be obtained.

PA Scoresheets

Site Name: CRAIG

CERCLIS ID No.: 5867

Street Address: 311 Avenue E

City/State/Zip: Selma Alabama

Investigator: Jake Hall

Agency/Organization: ADEM

Street Address: 1751 Dickinson Dr.

City/State/Zip: Montgomery AL 36130

Date: Sept 18 1995

INSTRUCTIONS FOR SCORESHEETS

Introduction

This scoresheets package functions as a self-contained workbook providing all of the basic tools to apply collected data and calculate a PA score. Note that a computerized scoring tool, "A-Score," is also available from EPA (Office of Solid Waste and Emergency Response, Directive 9345.1-11). The scoresheets provide space to:

- Record information collected during the PA
- Indicate references to support information
- Select and assign values ("scores") for factors
- Calculate pathway scores
- Calculate the site score

Do not enter values or scores in shaded areas of the scoresheets. You are encouraged to write notes on the scoresheets and especially on the Criteria Lists. On scoresheets with a reference column, indicate a number corresponding to attached sources of information or pages containing rationale for hypotheses; attach to the scoresheets a numbered list of these references. Evaluate all four pathways. Complete all Criteria Lists, scoresheets, and tables. Show calculations, as appropriate. If scoresheets are photocopy reproduced, copy and submit the numbered pages (right-side pages) only.

GENERAL INFORMATION

Site Description and Operational History: Briefly describe the site and its operating history. Provide the site name, owner/operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note also if these activities are documented or alleged. Identify probable source types and prior spills. Summarize highlights of previous investigations.

Probable Substances of Concern: List hazardous substances that have or may have been stored, handled, or disposed at the site, based on your knowledge of site operations. Identify the sources to which the substances may be related. Summarize any existing analytical data concerning hazardous substances detected onsite, in releases from the site, or at targets.

GENERAL INFORMATION

Site Description and Operational History:

The civil Engineering Complex consisted of several wood frame buildings that were located near the golf course (Fig. 1, Att. 3-4). On December 6, 1993, the Dallas County Engineering Department was demolishing the old Corp of Engineers building when a 55-gallon drum was ruptured. The crew that continued to work in the contaminated area became ill with dizziness, nausea, and eye irritation. Eight people became ill and 1 required a hospital visit. Debris was taken from the building was taken to 4 other locations. Ultimately the contaminated debris from Selmont Service Station was returned to the dumpsite. Subsequent samples were taken to locate the most heavily contaminated soils did not detect any cyclohexanone. It is assumed that the material was high volatile and volatized up removal back to Craig.

Before Craig Air force Base closed in 1977, the civil Engineering Complex housed the base utility shops. This area handled all the plumbing, painting, refrigeration, electrical heating, and air conditioning buildings. Maintenance personnel worked from the area everyday doing typical ground maintenance throughout the entire base (Att. 3, Ref. 6).

Probable Substances of Concern:
(Previous investigations, analytical data)

CYCLOHEXANONE NIOSH: GW 1050000

CAS: 108-94-1

DOT: 1915

mf: $C_6H_{10}O$ mw: 98.16

PROP: Colorless liquid, acetone-like odor. Mp: -45.0°, bp: 115.6°, wlc: 3.5-40, lel: 1.1% @ 100°, flash p: 111°F, d: 0.9478 @ 20°/4°, autoign temp: 788°F, vap press: 10 mm @ 38.7°, vap d: 3.4.

SYNS:

CICLOESANONE (ITALIAN)
CYCLOHEXANON (DUTCH)
CYKLOHEKSANON (POLISH)
HEXANON
KETOHEXAMETHYLENE
NADONE
NCI-C55001
PIMELIC KETONE
RCRA WASTE NUMBER U057
SEXTONE

TOXICITY DATA.

CODEN:

eye-hmn 75 ppm JIHTAB 25,282,43
skn-rbt 500 mg open MLD UCDS**
eye-rbt 4740 µg SEV AJOPAA 29,1363,46
mma-sat 20 µL/L EIMBA2 18,213,83
mmo-bcs 200 µL/L EIMBA2 18,213,83
cyt-hmn:leu 100 µmol/L DBITAD 19,215,71
cyt-hmn:lym 5 µg/L GISAAA 45(5),76,81
sce-ham:ovr 7500 µL/L ENMUDM 7(Suppl 3),60,85
msc-ham:ovr 7500 µL/L ENMUDM 7(Suppl 3),60,85
ihl-rat TDLo:105 mg/m³/4H TPKVAL 14,26,75
(1-20D preg):REP
ihl-hmn TCLo:75 ppm: JIHTAB 25,282,43
NOSE,EYE,PUL
orl-rat LD50:1535 mg/kg AIHAAP 30,470,69
ihl-rat LC50:8000 ppm/4H NPIRI* 1,18,74
scu-rat LD50:2170 mg/kg JIHTAB 25,415,43
orl-mus LD50:1400 mg/kg NTIS** AD-A066-307
ipr-mus LD50:1350 mg/kg COREAF 254,2245,62
scu-mus LDLo:1300 mg/kg AEXPBL 50,199,1903
ivn-dog LDLo:630 mg/kg 14CYAT 2,1719,63
orl-rbt LDLo:1600 mg/kg JIHTAB 25,199,43
skn-rbt LD50:1000 mg/kg AIHAAP 30,470,69
skn-rbt LD50:948 mg/kg AIHAAP 30,470,69
ihl-gpg TCLo:400 ppm/4H NTIS** AD-A066-307
ipr-gpg LDLo:760 mg/kg NTIS** AD-A066-307
scu-frg LDLo:1900 mg/kg AEXPBL 50,199,1903

Reported in EPA TSCA Inventory.

OSHA PEL: TWA 50 ppm

ACGIH TLV: TWA 25 ppm (skin)

DFG MAK: 50 ppm (200 mg/m³)

NIOSH REL: TWA 100 mg/m³

DOT Classification: Flammable or Combustible Liquid; Label: Flammable Liquid

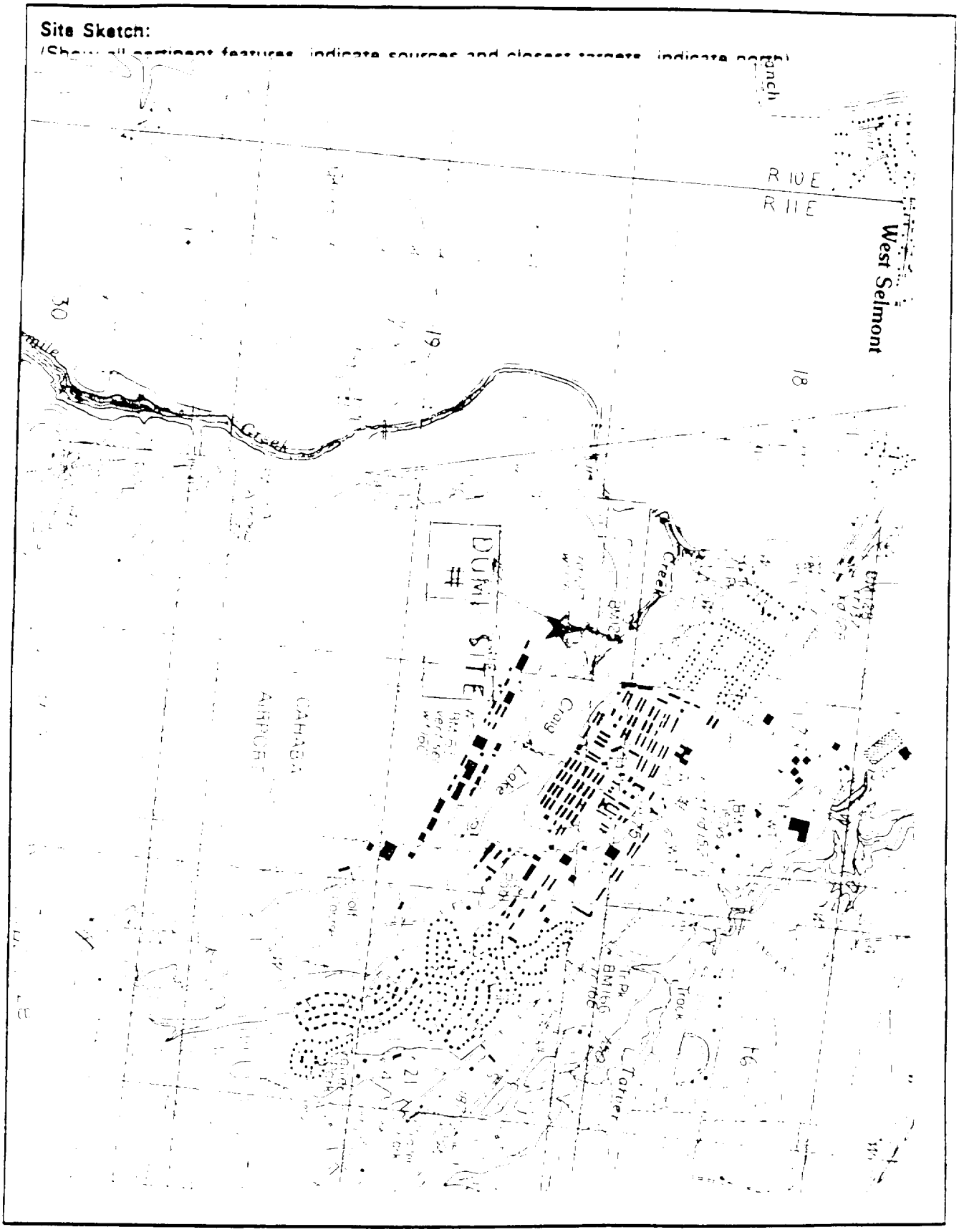
THR: Moderately toxic by ingestion, inhalation, subcutaneous, intravenous, and intraperitoneal routes. A skin and severe eye irritant. Human systemic effects by inhalation: changes in the sense of smell, conjunctiva irritation, and unspecified respiratory system changes. Human irritant by inhalation. Mild narcotic properties have also been ascribed to it. Human mutagenic data. Experimental reproductive effects. Flammable when exposed to [illegible]

GENERAL INFORMATION (continued)

Site Sketch: Prepare a sketch of the site (freehand is acceptable). Indicate all pertinent features of the site and nearby environs, including: waste sources, buildings, residences, access roads, parking areas, drainage patterns, water bodies, vegetation, wells, sensitive environments, etc.

GENERAL INFORMATION (continued)

Site Sketch:



SOURCE EVALUATION

- Number and name each source (e.g., 1. East Drum Storage Area, 2. Sludge Lagoon, 3. Battery Pile).
- Identify source type according to the list below.
- Describe the physical character of each source (e.g., dimensions, contents, waste types, containment, operating history).
- Show waste quantity (WQ) calculations for each source for appropriate tiers. Refer to instructions opposite page 5 and PA Tables 1a and 1b. Identify waste quantity tier and waste characteristics (WC) factor category score (for a site with a single source, according to PA Table 1a). Determine WC from PA Table 1b for the sum of source WQs for a multiple-source site.
- Attach additional sheets if necessary.
- Determine the site WC factor category score and record at the bottom of the page.

Source Type Descriptions

Landfill: an engineered (by excavation or construction) or natural hole in the ground into which wastes have been disposed by backfilling, or by contemporaneous soil deposition with waste disposal, covering wastes from view.

Surface Impoundment: a topographic depression, excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold accumulated liquid wastes, wastes containing free liquids, or sludges that were not backfilled or otherwise covered during periods of deposition; depression may be dry if deposited liquid has evaporated, volatilized or leached, or wet with exposed liquid; structures that may be more specifically described as lagoon pond, aeration pit, settling pond, tailings pond, sludge pit, etc.; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

Drums: portable containers designed to hold a standard 55-gallon volume of wastes.

Tanks and Non-Drum Containers: any stationary device, designed to contain accumulated wastes, constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic) that provide structural support; any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: soil onto which available evidence indicates that a hazardous substance was spilled, spread, disposed, or deposited.

Pile: any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of piles are: Chemical Waste Pile – consists primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks; Scrap Metal or Junk Pile – consists primarily of scrap metal or discarded durable goods such as appliances, automobiles, auto parts, or batteries, composed of materials suspected to contain or have contained a hazardous substance; Tailings Pile – consists primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation; Trash Pile – consists primarily of paper, garbage, or discarded non-durable goods which are suspected to contain or have contained a hazardous substance.

Land Treatment: landfarming or other land treatment method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

Other: a source that does not fit any of the descriptions above; examples include contaminated building, ground water plume with no identifiable source, storm drain, dry well, and injection well.

SOURCE EVALUATION

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
	Contaminated Soil	1152 cu. ft.

Source Description:

24' x 48' x 1' = 1152 cu. ft.

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:

Source Description:

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:

Source Description:

Site WC.
15

SOURCE EVALUATION

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
Source Description:		

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
Source Description:		

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
Source Description:		

Site WC.

WASTE CHARACTERISTICS (WC) SCORES

WC, based on waste quantity, may be determined by one or all of four measures called "tiers": constituent quantity, wastestream quantity, source volume, and source area. PA Table 1a (page 5) is divided into these four tiers. The amount and detail of information available determine which tier(s) to use for each source. For each source, evaluate waste quantity by as many of the tiers as you have information to support, and select the result that gives you the highest WC score. If minimal, incomplete, or no information is available regarding waste quantity, assign a WC score of 18 (minimum).

PA Table 1a has 6 columns: column 1 indicates the quantity tier; column 2 lists source types for the four tiers; columns 3, 4, and 5 provide ranges of waste amount for sites with only one source, which correspond to WC scores at the top of the columns (18, 32, or 100); column 6 provides formulas to obtain source waste quantity (WQ) values at sites with multiple sources.

To determine WC for sites with only one source:

1. *Identify source type (see descriptions opposite page 4).*
2. *Examine all waste quantity data available.*
3. *Estimate the mass and/or dimensions of the source.*
4. *Determine which quantity tiers to use based on available source information.*
5. *Convert source measurements to appropriate units for each tier you can evaluate for the source.*
6. *Identify the range into which the total quantity falls for each tier evaluated (PA Table 1a).*
7. *Determine the highest WC score obtained for any tier (18, 32, or 100, at top of PA Table 1a columns 3, 4, and 5, respectively).*
8. *Use this WC score for all pathways.* *

To determine WC for sites with multiple sources:

1. *Identify each source type (see descriptions opposite page 4).*
2. *Examine all waste quantity data available for each source.*
3. *Estimate the mass and/or dimensions of each source.*
4. *Determine which quantity tiers to use for each source based on the available information.*
5. *Convert source measurements to appropriate units for each tier you can evaluate for each source.*
6. *For each source, use the formulas in column 6 of PA Table 1a to determine the WQ value for each tier that can be evaluated. The highest WQ value obtained for any tier is the WQ value for the source.*
7. *Sum the WQ values for all sources to get the site WQ total.*
8. *Use the site WQ total from step 7 to assign the WC score from PA Table 1b.*
9. *Use this WC score for all pathways.* *

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* The WC score is considered in all four pathways. However, if a primary target is identified for the ground water, surface water, or air migration pathway, assign the determined WC or a score of 32, whichever is greater, as the WC score for that pathway.

PA TABLE 1: WASTE CHARACTERISTICS (WC) SCORES

PA Table 1a: WC Scores for Single Source Sites and Formulas for Multiple Source Sites

TIER	SOURCE TYPE	SINGLE SOURCE SITES (assigned WC scores)			MULTIPLE SOURCE SITES
		WC = 18	WC = 32	WC = 100	Formula for Assigning Source WQ Values
CONCENTRATION	N/A	≤100 lb	>100 to 10,000 lb	>10,000 lb	lb ÷ 1
WASTESTREAM	N/A	≤500,000 lb	>500,000 to 50 million lb	>50 million lb	lb ÷ 5,000
VOLUME	Landfill	≤6.75 million ft³ ≤250,000 yd³	>6.75 million to 675 million ft³ >250,000 to 25 million yd³	>675 million ft³ >25 million yd³	ft³ ÷ 67,500 yd³ ÷ 2,500
	Surface impoundment	≤6,750 ft³ ≤250 yd³	>6,750 to 675,000 ft³ >250 to 25,000 yd³	>675,000 ft³ >25,000 yd³	ft³ ÷ 67.5 yd³ ÷ 2.5
	Drums	≤1,000 drums	>1,000 to 100,000 drums	>100,000 drums	drums ÷ 10
	Tanks and non-drum containers	≤50,000 gallons	>50,000 to 5 million gallons	>5 million gallons	gallons ÷ 500
	Contaminated soil	≤6.75 million ft³ ≤250,000 yd³	>6.75 million to 675 million ft³ >250,000 to 25 million yd³	>675 million ft³ >25 million yd³	ft³ ÷ 67,500 yd³ ÷ 2,500
	Pile	≤6,750 ft³ ≤250 yd³	>6,750 to 675,000 ft³ >250 to 25,000 yd³	>675,000 ft³ >25,000 yd³	ft³ ÷ 67.5 yd³ ÷ 2.5
	Other	≤6,750 ft³ ≤250 yd³	>6,750 to 675,000 ft³ >250 to 25,000 yd³	>675,000 ft³ >25,000 yd³	ft³ ÷ 67.5 yd³ ÷ 2.5
AREA	Landfill	≤340,000 ft² ≤7.8 acres	>340,000 to 34 million ft² >7.8 to 780 acres	>34 million ft² >780 acres	ft² ÷ 3,400 acres ÷ 0.078
	Surface impoundment	≤1,300 ft² ≤0.029 acres	>1,300 to 130,000 ft² >0.029 to 2.9 acres	>130,000 ft² >2.9 acres	ft² ÷ 13 acres ÷ 0.00029
	Contaminated soil	≤3.4 million ft² ≤78 acres	>3.4 million to 340 million ft² >78 to 7,800 acres	>340 million ft² >7,800 acres	ft² ÷ 34,000 acres ÷ 0.78
	Pile*	≤1,300 ft² ≤0.029 acres	>1,300 to 130,000 ft² >0.029 to 2.9 acres	>130,000 ft² >2.9 acres	ft² ÷ 13 acres ÷ 0.00029
	Land treatment	≤27,000 ft² ≤0.62 acres	>27,000 to 2.7 million ft² >0.62 to 62 acres	>2.7 million ft² >62 acres	ft² ÷ 270 acres ÷ 0.0062

1 ton = 2,000 lb = 1 yd³ = 4 drums = 200 gallons

* Use area of land surface under pile, not surface area of pile.

PA Table 1b: WC Scores for Multiple Source Sites

WQ Total	WC Score
>0 to 100	18
>100 to 10,000	32
>10,000	100

GROUND WATER PATHWAY

Ground Water Use Description: Provide information on ground water use in the vicinity. Present the general stratigraphy, aquifers used, and distribution of private and municipal wells.

Calculations for Drinking Water Populations Served by Ground Water: Provide populations from private wells and municipal supply systems in each distance category. Show apportionment calculations for blended supply systems.

GROUND WATER PATHWAY
GROUND WATER USE DESCRIPTION

Describe Ground Water Use Within 4-miles of the Site:
(Describe stratigraphy, information on aquifers, municipal and/or private wells)

Craig Field is situated in the Gulf Coastal Plain physiographic province. The Dallas Co area is served by the Dallas County Water & Fire Protection Authority (Ref 8-9). All residents obtain potable water from the public water system, and 2 municipal water supply wells exist within a 4-mile radius of the base. The closest well is 0.3 miles west direction from the site. These wells are screened at depths greater than 100 feet. Private water supply, industrial and irrigation wells are known to exist within 10 miles of the site. The citizens are supplied with water by the public water system that is not a blended system. Aquifers in the Coker, Gordo, Eutaw, and Ripley Formations, yield an adequate supply of water for domestic and stock use. Artesian aquifers in the Coker, Gordo, and Eutaw Formations are the principal sources of water. The lower feet of each unit are the most productive zones yielding as much as 1500 gallons per minute (gpm). (Att. 5)

Calculations for Drinking Water Populations Served by Ground Water:

3 Public Wells 3-4 miles NNW of site
there are only 2 active wells serving 6,300 people for the Dallas Co Water & Fire Protection.

GROUND WATER PATHWAY CRITERIA LIST

This "Criteria List" helps guide the process of developing hypotheses concerning the occurrence of a suspected release and the exposure of specific targets to a hazardous substance. The check-boxes record your professional judgment in evaluating these factors. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypotheses, list them at the bottom of the page or attach an additional page.

The "Suspected Release" section identifies several site, source, and pathway conditions that could provide insight as to whether a release from the site is likely to have occurred. If a release is suspected, use the "Primary Targets" section to evaluate conditions that may help identify targets likely to be exposed to a hazardous substance. Record responses for the well that you feel has the highest probability of being exposed to a hazardous substance. You may use this section of the chart more than once, depending on the number of targets you feel may be considered "primary."

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question. If you check the "Suspected Release" box as "yes," make sure you assign a Likelihood of Release value of 550 for the pathway.

GROUND WATER PATHWAY CRITERIA LIST

SUSPECTED RELEASE

Yes	No	Unk	
☑	☐	☐	Are sources poorly contained?
☐	☑	☐	Is the source a type likely to contribute to ground water contamination (e.g., wet lagoon)?
☐	☑	☐	Is waste quantity particularly large?
☑	☐	☐	Is precipitation heavy?
☐	☑	☐	Is the infiltration rate high?
☐	☑		Is the site located in an area of karst terrain?
☐	☑	☐	Is the subsurface highly permeable or conductive?
☐	☑	☐	Is drinking water drawn from a shallow aquifer?
☐	☐	☑	Are suspected contaminants highly mobile in ground water?
☐	☑	☐	Does analytical or circumstantial evidence suggest ground water contamination?
☐	☐		Other criteria? _____
☐	☑		**SUSPECTED RELEASE?**

PRIMARY TARGET

Yes	No	Unk	
☐	☑	☐	Is any drinking water well nearby?
☐	☑	☐	Has any nearby drinking water well been closed?
☐	☐	☑	Has any nearby drinking water user reported foul-tasting or foul-smelling water?
☐	☐	☑	Does any nearby well have a large drawdown or high production rate?
☐	☑	☐	Is any drinking water well located between the site and other wells that are suspected to be exposed to a hazardous substance?
☐	☑	☐	Does analytical or circumstantial evidence suggest contamination at a drinking water well?
☐	☑	☐	Does any drinking water well warrant sampling?
☐	☐		Other criteria? _____
☐	☑		**PRIMARY TARGET(S) IDENTIFIED?**

Summarize the rationale for Suspected Release (attach an additional page if necessary):

Very small spill.
Public drinking water supplies are 3-4 miles from source and they tap a relatively deep aquifer.

Summarize the rationale for Primary Targets (attach an additional page if necessary):

GROUND WATER PATHWAY SCORESHEET

Pathway Characteristics

Answer the questions at the top of the page. Refer to the Ground Water Pathway Criteria List (page 7) to hypothesize whether you suspect that a hazardous substance associated with the site has been released to ground water. Record depth to aquifer (in feet): the difference between the deepest occurrence of a hazardous substance and the depth of the top of the shallowest aquifer at (or as near as possible) to the site. Note whether the site is in karst terrain (characterized by abrupt ridges, sink holes, caverns, springs, disappearing streams). Record the distance (in feet) from any source to the nearest well used for drinking water.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Ground Water Pathway Criteria List (page 7). If you suspect a release to ground water, use only Column A for this pathway and do not evaluate factor 2.

2. **No Suspected Release:** If you do not suspect a release, determine score based on depth to aquifer or whether the site is in an area of karst terrain. If you do not suspect a release to ground water, use only Column B to score this pathway.

Targets (T)

This factor category evaluates the threat to populations obtaining drinking water from ground water. To apportion populations served by blended drinking water supply systems, determine the percentage of population served by each well based on its production.

3. **Primary Target Population:** Evaluate populations served by all drinking water wells that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Ground Water Pathway Criteria List (page 7) to make this determination. In the space provided, enter the population served by any wells you suspect have been exposed to a hazardous substance from the site. If only the number of residences is known, use the average county residents per household (rounded up to the next integer) to determine population served. Multiply the population by 10 to determine the Primary Target Population score. Note that if you do not suspect a release, there can be no primary target population.

4. **Secondary Target Population:** Evaluate populations served by all drinking water wells within 4 miles that you do not suspect have been exposed to a hazardous substance. Use PA Table 2a or 2b (for wells drawing from non-karst and karst aquifers, respectfully) (page 9). If only the number of residences is known, use the average county residents per household (rounded to the nearest integer) to determine population served. Circle the assigned value for the population in each distance category and enter it in the column on the far-right side of the table. Sum the far-right column and enter the total as the Secondary Target Population factor score.

5. **Nearest Well** represents the threat posed to the drinking water well that is most likely to be exposed to a hazardous substance. If you have identified a primary target population, enter 50. Otherwise, assign the score from PA Table 2a or 2b for the closest distance category with a drinking water well population.

6. **Wellhead Protection Area (WHPA):** WHPAs are special areas designated by States for protection under Section 1428 of the Safe Drinking Water Act. Local/State and EPA Regional water officials can provide information regarding the location of WHPAs.

7. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if ground water within 4 miles has no resource use.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

Waste Characteristics (WC)

8. **Waste Characteristics:** Score is assigned from page 4. However, if you have identified any primary target for ground water, assign either the score calculated on page 4 or a score of 32, whichever is greater.

Ground Water Pathway Score: Multiply the scores for LR, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

GROUND WATER PATHWAY SCORESHEET

Pathway Characteristics		
Do you suspect a release (see Ground Water Pathway Criteria List, page 7)?	Yes ___	No ✓
Is the site located in karst terrain?	Yes ___	No ✓
Depth to aquifer:	220 ft	
Distance to the nearest drinking water well:	3.6 mi ft	

	A Suspected Release	B No Suspected Release	Reference
LIKELIHOOD OF RELEASE			
1. SUSPECTED RELEASE: If you suspect a release to ground water (see page 7), assign a score of 550. Use only column A for this pathway.			
2. NO SUSPECTED RELEASE: If you do not suspect a release to ground water, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Use only column B for this pathway.		340	
LR =		340	
TARGETS			
3. PRIMARY TARGET POPULATION: Determine the number of people served by drinking water wells that you suspect have been exposed to a hazardous substance from the site (see Ground Water Pathway Criteria List, page 7). _____ people x 10 =			
4. SECONDARY TARGET POPULATION: Determine the number of people served by drinking water wells that you do NOT suspect have been exposed to a hazardous substance from the site, and assign the total population score from PA Table 2. Are any wells part of a blended system? Yes ___ No ___ If yes, attach a page to show apportionment calculations.		42	
5. NEAREST WELL: If you have identified a primary target population for ground water, assign a score of 50; otherwise, assign the Nearest Well score from PA Table 2. If no drinking water wells exist within 4 miles, assign a score of zero.		2	
6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA, or if you have identified any primary target well within a WHPA, assign a score of 20; assign 5 if neither condition holds but a WHPA is present within 4 miles; otherwise assign zero.		5	
7. RESOURCES		5	
T =		54	
WASTE CHARACTERISTICS			
8. A. If you have identified any primary target for ground water, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.			
B. If you have NOT identified any primary target for ground water, assign the waste characteristics score calculated on page 4.		18	
WC =			

GROUND WATER PATHWAY SCORE: $\dfrac{LR \times T \times WC}{82{,}500}$ = 4.0

PA TABLE 2: VALUES FOR SECONDARY GROUND WATER TARGET POPULATIONS

PA Table 2a: Non-Karst Aquifers

Distance from Site	Population	Nearest Well (choose highest)	Population Served by Wells Within Distance Category: 1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	Greater than 100,000	Population Value
0 to ¼ mile	0	20	1	2	5	16	52	163	521	1,633	5,214	16,325	0
> ¼ to ½ mile	0	18	1	1	3	10	32	101	323	1,012	3,233	10,121	0
> ½ to 1 mile	0	9	1	1	2	5	17	52	167	522	1,668	5,224	0
> 1 to 2 miles	0	5	1	1	1	3	9	29	94	294	938	2,938	0
> 2 to 3 miles	0	3	1	1	1	2	7	21	68	212	678	2,122	0
> 3 to 4 miles	6,300	(2)	1	1	1	1	4	13	(42)	131	417	1,308	42
Nearest Well =		2										Score =	42

PA Table 2b: Karst Aquifers

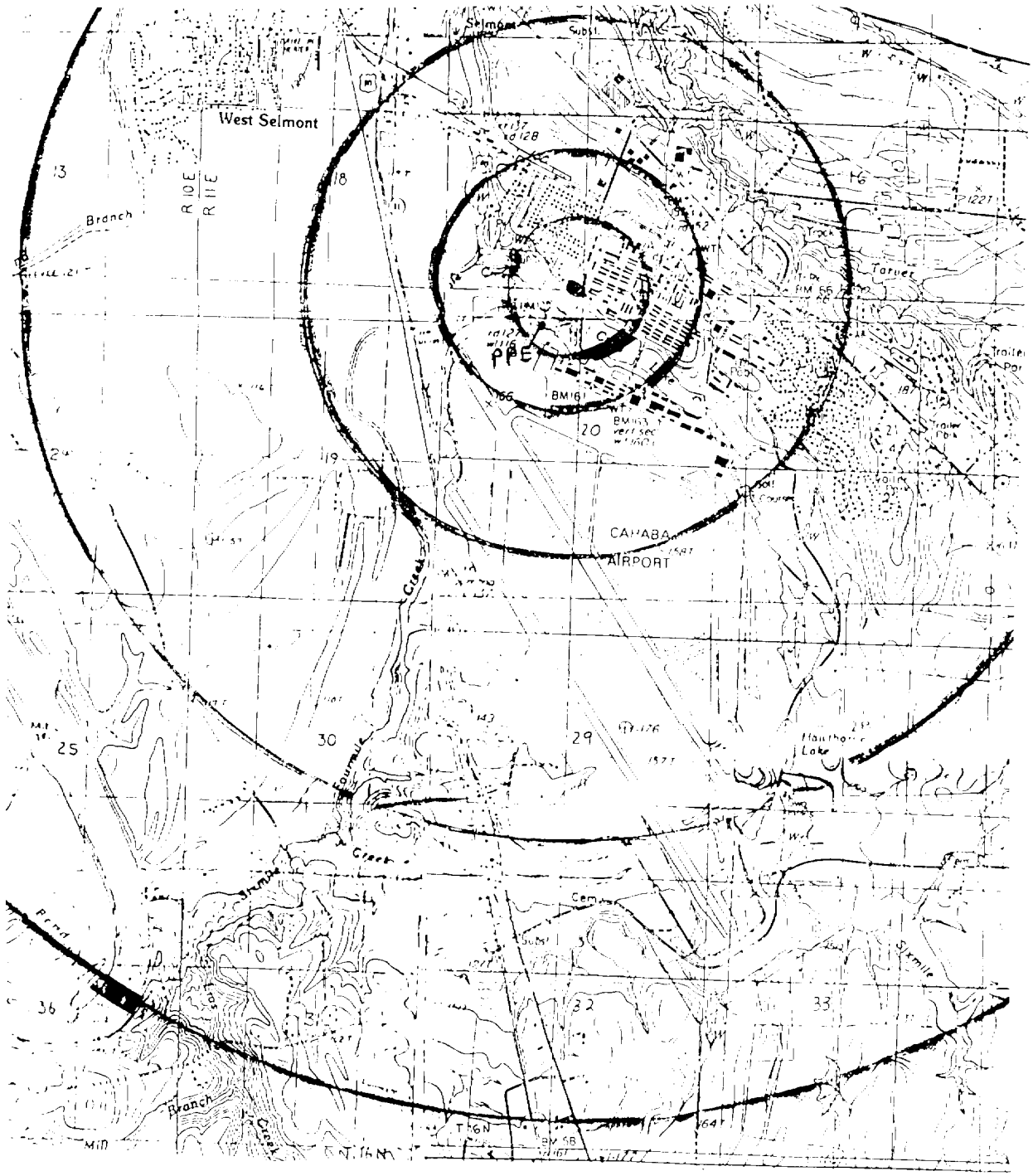
Distance from Site	Population	Nearest Well (use 20 for karst)	Population Served by Wells Within Distance Category: 1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	Greater than 100,000	Population Value
0 to ¼ mile		20	1	2	5	16	52	163	521	1,633	5,214	16,325	
> ¼ to ½ mile		20	1	1	3	10	32	101	323	1,012	3,233	10,121	
> ½ to 1 mile		20	1	1	3	8	26	82	261	816	2,607	8,162	
> 1 to 2 miles		20	1	1	3	8	26	82	261	816	2,607	8,162	
> 2 to 3 miles		20	1	1	3	8	26	82	261	816	2,607	8,162	
> 3 to 4 miles		20	1	1	3	8	26	82	261	816	2,607	8,162	
Nearest Well =												Score =	

SURFACE WATER PATHWAY

Migration Route Sketch: Sketch the surface water migration pathway (freehand is acceptable) illustrating the drainage route and identifying water bodies, probable point of entry, flows, and targets.

SURFACE WATER PATHWAY
MIGRATION ROUTE SKETCH

Suface Water Migration Route Sketch:
(include runoff route, probable point of entry, 15-mile target distance limit, intakes, fisheries, and sensitive environments)



SURFACE WATER PATHWAY CRITERIA LIST

This "Criteria List" helps guide the process of developing hypotheses concerning the occurrence of a suspected release and the exposure of specific targets to a hazardous substance. The check-boxes record your professional judgment in evaluating these factors. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypotheses, list them at the bottom of the page or attach an additional page.

The "Suspected Release" section identifies several site, source, and pathway conditions that could provide insight as to whether a release from the site is likely to have occurred. If a release is suspected, use the "Primary Targets" section to guide you through evaluation of some conditions that may help identify targets likely to be exposed to a hazardous substance. Record responses for the target that you feel has the highest probability of being exposed to a hazardous substance. You may use this section of the chart more than once, depending on the number of targets you feel may be considered "primary."

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question. If you check the "Suspected Release" box as "yes," make sure you assign a Likelihood of Release value of 550 for the pathway.

If the distance to surface water is greater than 2 miles, do not evaluate the surface water migration pathway. Document the source of information in the text boxes below the surface water criteria list.

SURFACE WATER PATHWAY CRITERIA LIST

SUSPECTED RELEASE

Yes	No	Unk	
X	☐	☐	Is surface water nearby?
☐	■	☐	Is waste quantity particularly large?
X	☐	☐	Is the drainage area large?
X	☐	☐	Is rainfall heavy?
☐	X	☐	Is the infiltration rate low?
X	☐	☐	Are sources poorly contained or prone to runoff or flooding?
X	☐	☐	Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
☐	X	☐	Is vegetation stressed along the probable run-off route?
☐	X	☐	Are sediments or water unnaturally discolored?
☐	■	☐	Is wildlife unnaturally absent?
☐	■	☐	Has deposition of waste into surface water been observed?
☐	■	☐	Is ground water discharge to surface water likely?
☐	■	☐	Does analytical or circumstantial evidence suggest surface water contamination?
☐	☐		Other criteria? _____
X	☐		**SUSPECTED RELEASE?**

PRIMARY TARGETS

Yes	No	Unk	
X	☐	☐	Is any target nearby? If yes:
			☐ Drinking water intake
			X Fishery
			☐ Sensitive environment
☐	X	☐	Has any intake, fishery, or recreational area been closed?
X	☐	☐	Does analytical or circumstantial evidence suggest surface water contamination at or downstream of a target?
☐	X	☐	Does any target warrant sampling? If yes:
			☐ Drinking water intake
			☐ Fishery
			☐ Sensitive environment
☐	☐		Other criteria? _____
☐	X		**PRIMARY INTAKE(S) IDENTIFIED?**
☐	X		**PRIMARY FISHERY(IES) IDENTIFIED?**
☐	X		**PRIMARY SENSITIVE ENVIRONMENT(S) IDENTIFIED?**

Summarize the rationale for Suspected Release (attach an additional page if necessary):

Summarize the rationale for Primary Targets (attach an additional page if necessary):

SURFACE WATER PATHWAY LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT SCORESHEET

Pathway Characteristics

The surface water pathway includes three threats: Drinking Water Threat, Human Food Chain Threat, and Environmental Threat. Answer the questions at the top of the page. Refer to the Surface Water Pathway Criteria List (page 11) to hypothesize whether you suspect that a hazardous substance associated with the site has been released to surface water. Record the distance to surface water (the shortest overland drainage distance from a source to a surface water body). Record the flood frequency at the site (e.g., 100-yr, 200-yr). If the site is located in more than one floodplain, use the most frequent flooding event. Identify surface water use(s) along the surface water migration path and their distance(s) from the site.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Surface Water Pathway Criteria List (page 11). If you suspect a release to surface water, use only Column A for this pathway and do not evaluate factor 2.

2. **No Suspected Release:** If you do not suspect a release, determine score based on the shortest overland drainage distance from a source to a surface water body. If distance to surface water is 2,500 feet or less, assign a score of 500. If distance to surface water is greater than 2,500 feet, determine score based on flood frequency. If you do not suspect a release to surface water, use only Column B to score this pathway.

Drinking Water Threat Targets (T)

3. List all drinking water intakes on downstream surface water bodies along the surface water migration path. Record the intake name, the type of water body on which the intake is located, the flow of the water body, and the number of people served by the intake (apportion the population if part of a blended system).

4. **Primary Target Population:** Evaluate populations served by all drinking water intakes that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. In the space provided, enter the population served by all intakes you suspect have been exposed to a hazardous substance from the site. If only the number of residences is known, use the average county residents per household (rounded up to the next integer) to determine population served. Multiply by 10 to determine the Primary Target Population score. Remember, if you do not suspect a release, there can be no primary target population.

5. **Secondary Target Population:** Evaluate populations served by all drinking water intakes within the target distance limit that you do not suspect have been exposed to a hazardous substance. Use PA Table 3 (page 13) and enter the population served by intakes for each flow category. If only the number of residences is known, use the average county residents per household (rounded to the nearest integer) to determine population served. Circle the assigned value for the population in each flow category and enter it in the column on the far-right side of the table. Sum the far-right column and enter the total as the Secondary Target Population factor score.

Gauging station data for many surface water bodies are available from USGS or other sources. In the absence of gauging station data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that the flow category "mixing zone of quiet flowing rivers" is limited to 3 miles from the probable point of entry.

6. **Nearest Intake** represents the threat posed to the drinking water intake that is most likely to be exposed to a hazardous substance. If you have identified a primary target population, enter 50. Otherwise, assign the score from PA Table 3 (page 13) for the lowest-flowing water body on which there is an intake.

7. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if surface water within the target distance limit has no resource use.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT SCORESHEET

Pathway Characteristics

Do you suspect a release (see Surface Water Pathway Criteria List, page 111)? Yes ✓ No ___
Distance to surface water: 0 ft
Flood frequency: 100 yrs
What is the downstream distance to the nearest drinking water intake? NA miles
Nearest fishery? 3.26 miles Nearest sensitive environment? 0 miles

LIKELIHOOD OF RELEASE WORSE CASE	A Suspected Release	B No Suspected Release	Reference
1 SUSPECTED RELEASE: If you suspect a release to surface water (see page 11), assign a score of 550. Use only column A for this pathway.	550		
2. NO SUSPECTED RELEASE: If you do not suspect a release to surface water, use the table below to assign a score based on distance to surface water and flood frequency. Use only column B for this pathway.			
LR =	550		

Distance to surface water ≤ 2,500 feet	500
Distance to surface water > 2,500 feet, and	
Site in annual or 10-year floodplain	500
Site in 100-year floodplain	400
Site in 500-year floodplain	300
Site outside 500-year floodplain	100

DRINKING WATER THREAT TARGETS

3. Record the water body type, flow (if applicable), and number of people served by each drinking water intake within the target distance limit. If there is no drinking water intake within the target distance limit, factors 4, 5, and 6 each receive zero scores.

Intake Name	Water Body Type	Flow	People Served
		___ cfs	
		___ cfs	
		___ cfs	

4. PRIMARY TARGET POPULATION: If you suspect any drinking water intake listed above has been exposed to a hazardous substance from the site (see Surface Water Pathway Criteria List, page 111), list the intake name(s) and calculate the factor score based on the total population served.

___, ___

___ people x 10 = 0

5. SECONDARY TARGET POPULATION: Determine the number of people served by drinking water intakes that you do NOT suspect have been exposed to a hazardous substance from the site, and assign the total population score from PA Table 3. 0

Are any intakes part of a blended system? Yes ___ No ___
If yes, attach a page to show apportionment calculations.

6. NEAREST INTAKE: If you have identified a primary target population for the drinking water threat (factor 4), assign a score of 50; otherwise, assign the Nearest Intake score from PA Table 3. If no drinking water intake exists within the target distance limit, assign a score of zero. 0

7 RESOURCES 5

T = 5

PA TABLE 3: VALUES FOR SECONDARY SURFACE WATER TARGET POPULATIONS

Surface Water Body Flow (see PA Table 4)	Population	Nearest Intake (choose highest)	Population Served by Intakes Within Flow Category											Population Value
			1 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	Greater than 1,000,000	
< 10 cfs	_____	20	2	6	18	62	183	621	1,833	6,214	18,325	62,136	183,248	_____
10 to 100 cfs	_____	2	1	1	2	6	18	62	183	621	1,833	6,214	18,325	_____
> 100 to 1,000 cfs	_____	1	0	0	1	1	2	6	18	62	183	621	1,833	_____
> 1,000 to 10,000 cfs	_____	0	0	0	0	0	1	1	2	6	18	62	183	_____
> 10,000 cfs or Great Lakes	_____	0	0	0	0	0	0	0	1	1	2	6	18	_____
3 mile Mixing Zone	_____	10	1	3	8	28	82	281	818	2,807	8,182	28,068	81,663	_____
Nearest Intake =													Score =	

PA TABLE 4: SURFACE WATER TYPE / FLOW CHARACTERISTICS WITH DILUTION WEIGHTS FOR SECONDARY SURFACE WATER SENSITIVE ENVIRONMENTS

Type of Surface Water Body			Dilution Weight
Water Body Type	OR	Flow	
minimal stream		< 10 cfs	1
small to moderate stream		10 to 100 cfs	0.1
moderate to large stream		> 100 to 1,000 cfs	N/A
large stream to river		> 1,000 to 10,000 cfs	N/A
large river		> 10,000 cfs	N/A
3 mile mixing zone of quiet flowing streams or rivers		10 cfs or greater	N/A
coastal tidal water (harbors, sounds, bays, etc.), ocean, or Great Lakes		N/A	N/A

SURFACE WATER PATHWAY HUMAN FOOD CHAIN THREAT SCORESHEET

Likelihood of Release (LR)

LR is the same for all surface water pathway threats. Enter LR score from page 12.

Human Food Chain Threat Targets (T)

8. The only human food chain targets are fisheries. A fishery is an area of a surface water body from which food chain organisms are taken or could be taken for human consumption on a subsistence, sporting, or commercial basis. Food chain organisms include fish, shellfish, crustaceans, amphibians, and amphibious reptiles. Fisheries are delineated by changes in surface water body type (i.e., streams and rivers, lakes, coastal tidal waters, and oceans/Great Lakes) and whenever the flow characteristics of a stream or river change.

In the space provided, identify all fisheries within the target distance limit. Indicate the surface water body type and flow for each fishery. Gauging station flow data are available for many surface water bodies from USGS or other sources. In the absence of gauging station data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that, if there are no fisheries within the target distance limit, the Human Food Chain Threat Targets score is zero.

9. Primary fisheries are any fisheries within the target distance limit that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. If you identify any primary fisheries, list them in the space provided, enter 300 as the Primary Fisheries factor score, and do not evaluate Secondary Fisheries. Note that if you do not suspect a release, there can be no primary fisheries.

10. Secondary fisheries are fisheries that you do not suspect have been exposed to a hazardous substance. Evaluate this factor only if fisheries are present within the target distance limit, but none is considered a primary fishery.

A. If you suspect a release to surface water and have identified a secondary fishery but no primary fishery, assign a score of 210.

B. If you do not suspect a release, evaluate this factor based on flow. In the absence of gauging station flow data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). Assign a Secondary Fisheries score from the table on the scoresheet using the lowest flow at any fishery within the target distance limit. (Dilution weight multiplier does not apply to PA evaluation of this factor.)

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

SURFACE WATER PATHWAY (continued)
HUMAN FOOD CHAIN THREAT SCORESHEET

LIKELIHOOD OF RELEASE		A	B	Reference
		Substantial Release	No Substantial Release	
Enter Surface Water Likelihood of Release score from page 12.	LR =	550		

HUMAN FOOD CHAIN THREAT TARGETS

8. Record the water body type and flow (if applicable) for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a Targets score of 0 at the bottom of the page.

Fishery Name	Water Body Type	Flow
		____ cfs
		____ cfs
		____ cfs
		____ cfs
		____ cfs

9. **PRIMARY FISHERIES:** If you suspect any fishery listed above has been exposed to a hazardous substance from the site (see Surface Water Criteria List, page 11), assign a score of 300 and do not evaluate Factor 10. List the primary fisheries:

_____, _____

_____, _____

	0

10. SECONDARY FISHERIES

A. If you suspect a release to surface water and have identified a secondary fishery but no primary fishery, assign a score of 210.

B. If you do not suspect a release, assign a Secondary Fisheries score from the table below using the lowest flow at any fishery within the target distance limit.

Lowest Flow	Secondary Fisheries Score
< 10 cfs	210
10 to 100 cfs	30
> 100 cfs, coastal tidal waters, oceans, or Great Lakes	12

	210

T = 210

SURFACE WATER PATHWAY ENVIRONMENTAL THREAT SCORESHEET

Likelihood of Release (LR)

LR is the same for all surface water pathway threats. Enter LR score from page 12.

Environmental Threat Targets (T)

11. PA Table 5 (page 16) lists sensitive environments for the Surface Water Pathway Environmental Threat. In the space provided, identify all sensitive environments located within the target distance limit. Indicate the surface water body type and flow at each sensitive environment. Gauging station flow data for many surface water bodies are available from USGS or other sources. In the absence of gauging station data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that if there are no sensitive environments within the target distance limit, the Environmental Threat Targets score is zero.

12. Primary sensitive environments are surface water sensitive environments within the target distance limit that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. If you identify any primary sensitive environments, list them in the space provided, enter 300 as the Primary Sensitive Environments factor score, and do not evaluate Secondary Sensitive Environments. Note that if you do not suspect a release, there can be no primary sensitive environments.

13. Secondary sensitive environments are surface water sensitive environments that you do not suspect have been exposed to a hazardous substance. Evaluate this factor only if surface water sensitive environments are present within the target distance limit, but none is considered a primary sensitive environment. Evaluate secondary sensitive environments based on flow.

- In the table provided, list all secondary sensitive environments on surface water bodies with flow of 100 cfs or less.

  1) Use PA Table 4 (page 13) to determine the appropriate dilution weight for each.

  2) Use PA Tables 5 and 6 (page 16) to determine the appropriate value for each sensitive environment type and for wetlands frontage.

  3) For a sensitive environment that falls into more than one of the categories in PA Table 5, sum the values for each type to determine the environment value (e.g., a wetland with 1.5 miles frontage (value of 50) that is also a critical habitat for a Federally designated endangered species (value of 100) would receive a total value of 150).

  4) For each sensitive environment, multiply the dilution weight by the environment type (or length of wetlands) value and record the product in the far-right column.

  5) Sum the values in the far-right column and enter the total as the Secondary Sensitive Environments score. Do not evaluate part B of this factor.

- If all secondary sensitive environments are on surface water bodies with flows greater than 100 cfs assign 10 as the Secondary Sensitive Environments score.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

SURFACE WATER PATHWAY (continued)
ENVIRONMENTAL THREAT SCORESHEET

LIKELIHOOD OF RELEASE

		A	B	
		Suppressed Release	No Suppressed Release	Reference
Enter Surface Water Likelihood of Release score from page 12.	LR =	550		

ENVIRONMENTAL THREAT TARGETS

11. Record the water body type and flow (if applicable) for each surface water sensitive environment within the target distance limit (see PA Tables 4 and 5). If there is no sensitive environment within the target distance limit, assign a Targets score of 0 at the bottom of the page.

Environment Name	Water Body Type	Flow
		____ cfs
		____ cfs
		____ cfs
		____ cfs
		____ cfs

12. PRIMARY SENSITIVE ENVIRONMENTS: If you suspect any sensitive environment listed above has been exposed to a hazardous substance from the site (see Surface Water Criteria List, page 11), assign a score of 300 and do not evaluate factor 13. List the primary sensitive environments:

13. SECONDARY SENSITIVE ENVIRONMENTS: If sensitive environments are present, but none is a primary sensitive environment, evaluate Secondary Sensitive Environments based on flow.

A. For secondary sensitive environments on surface water bodies with flows of 100 cfs or less, assign scores as follows, and do not evaluate part B of this factor:

Flow	Dilution Weight (PA Table 4)		Environment Type and Value (PA Tables 5 and 6)		Total
____ cfs		x		=	
____ cfs		x		=	
____ cfs		x		=	
____ cfs		x		=	
____ cfs		x		=	

Score =

B. If all secondary sensitive environments are located on surface water bodies with flows > 100 cfs, assign a score of 10.

		10	
	T =	10	

PA TABLE 5: SURFACE WATER AND AIR PATHWAY SENSITIVE ENVIRONMENTS VALUES

Sensitive Environment	*Assigned Value*
Critical habitat for Federally designated endangered or threatened species Marine Sanctuary National Park Designated Federal Wilderness Area Ecologically important areas identified under the Coastal Zone Wilderness Act Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes) National Monument (air pathway only) National Seashore Recreation Area National Lakeshore Recreation Area	100
Habitat known to be used by Federally designated or proposed endangered or threatened species National Preserve National or State Wildlife Refuge Unit of Coastal Barrier Resources System Federal land designated for the protection of natural ecosystems Administratively Proposed Federal Wilderness Area Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary Migratory pathways and feeding areas critical for the maintenance of anadromous fish species in a river system Terrestrial areas utilized for breeding by large or dense aggregations of vertebrate animals (air pathway) or semi-aquatic foragers (surface water pathway) National river reach designated as Recreational	75
Habitat known to be used by State designated endangered or threatened species Habitat known to be used by a species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federally designated Scenic or Wild River	50
State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Area Particular areas, relatively small in size, important to maintenance of unique biotic communities	25
State designated areas for protection/maintenance of aquatic life under the Clean Water Act	5
Wetlands	See PA Table 6 (Surface Water Pathway) or PA Table 9 (Air Pathway)

PA TABLE 6: SURFACE WATER PATHWAY WETLANDS FRONTAGE VALUES

Total Length of Wetlands	*Assigned Value*
Less than 0.1 mile	0
0.1 to 1 mile	25
Greater than 1 to 2 miles	50
Greater than 2 to 3 miles	75
Greater than 3 to 4 miles	100
Greater than 4 to 8 miles	150
Greater than 8 to 12 miles	250
Greater than 12 to 16 miles	350
Greater than 16 to 20 miles	450
Greater than 20 miles	500

SURFACE WATER PATHWAY WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORES

Waste Characteristics (WC)

14. **Waste Characteristics**: Score is assigned from page 4. However, if a primary target has been identified for any surface water threat, assign either the score calculated on page 4 or a score of 32, whichever is greater.

Surface Water Pathway Threat Scores

Fill in the matrix with the appropriate scores from the previous pages. To calculate the score for each threat: multiply the scores for LR, T, and WC; divide the product by 82,500; and round the result to the nearest integer. The Drinking Water Threat and Human Food Chain Threat are each subject to a maximum of 100. The Environmental Threat is subject to a maximum of 60. Enter the rounded threat scores in the far-right column.

Surface Water Pathway Score

Sum the individual threat scores to determine the Surface Water Pathway Score. If the sum is greater than 100, assign 100.

SURFACE WATER PATHWAY (concluded)
WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS	A *Suspected Release*	B *No Suspected Release*
14. A. If you have identified any primary target for surface water (pages 12, 14, or 15), assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.		
B. If you have NOT identified any primary target for surface water, assign the waste characteristics score calculated on page 4.	18	
WC =	18	

SURFACE WATER PATHWAY THREAT SCORES

Threat	*Likelihood of Release (LR) Score (from page 12)*	*Targets (T) Score (pages 12, 14, 15)*	*Pathway Waste Characteristics (WC) Score – (determined above)*	*Threat Score LR x T x WC / 82,500*
Drinking Water	550	5	18	.6
Human Food Chain	550	210	18	25.2
Environmental	550	10	18	1.2

SURFACE WATER PATHWAY SCORE
(Drinking Water Threat + Human Food Chain Threat + Environmental Threat)

27.0

SOIL EXPOSURE PATHWAY CRITERIA LIST

Areas of surficial contamination can generally be assumed. This "Criteria List" helps guide the process of developing a hypothesis concerning the exposure of specific targets to a hazardous substance at the site. Use the "Resident Population" section to evaluate site and source conditions that may help identify targets likely to be exposed to a hazardous substance. The check-boxes record your professional judgment. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypothesis, list them at the bottom of the page or attach an additional page.

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question.

SOIL EXPOSURE PATHWAY CRITERIA LIST

SUSPECTED CONTAMINATION	*RESIDENT POPULATION*
Surficial contamination can generally be assumed.	Yes / No / Unk ☐ ■ ☐ Is any residence, school, or daycare facility on or within 200 feet of an area of suspected contamination? ■ ☐ ☐ Is any residence, school, or daycare facility located on adjacent land previously owned or leased by the site owner/operator? ☐ ■ ☐ Is there a migration route that might spread hazardous substances near residences, schools, or daycare facilities? ☐ ■ ☐ Have onsite or adjacent residents or students reported adverse health effects, exclusive of apparent drinking water or air contamination problems? ☐ ■ ☐ Does any neighboring property warrant sampling? ☐ ☐ Other criteria?_____ ☐ ■ RESIDENT POPULATION IDENTIFIED?

Summarize the rationale for Resident Population (attach an additional page if necessary):

SOIL EXPOSURE PATHWAY SCORESHEET

Pathway Characteristics

Answer the questions at the top of the page. Identify people who may be exposed to a hazardous substance because they work at the facility, or reside or attend school or daycare on or within 200 feet of an area of suspected contamination. If the site is active, estimate the number of full and part-time workers. Note that evaluation of targets is based on current site conditions.

Likelihood of Exposure (LE)

1. **Suspected Contamination:** Areas of surficial contamination are present at most sites, and a score of 550 can generally be assigned as a default measure. Assign zero, which effectively eliminates the pathway from further consideration, only if there is no surficial contamination; reliable analytical data are generally necessary to make this determination.

Resident Population Threat Targets (T)

2. **Resident Population** corresponds to "primary targets" for the migration pathways. Use professional judgment guided by the Soil Exposure Pathway Criteria List (page 18) to determine if there are people living or attending school or daycare on or within 200 feet of areas of suspected contamination. Record the number of people identified as resident population and multiply by 10 to determine the Resident Population factor score.

3. **Resident Individual:** Assign 50 if you have identified a resident population; otherwise, assign zero.

4. **Workers:** Estimate the number of full and part-time workers at this facility and adjacent facilities where contamination is also suspected. Assign a score for the Workers factor from the table.

5. **Terrestrial Sensitive Environments:** In the table provided, list each terrestrial sensitive environment located on an area of suspected contamination. Use PA Table 7 (page 20) to assign a value for each. Sum the values and assign the total as the factor score.

6. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if there is no land resource use on an area of suspected contamination.

Sum the target scores.

Waste Characteristics (WC)

7. Enter the WC score determined on page 4.

Resident Population Threat Score: Multiply the scores for LE, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

Nearby Population Threat Score: Do not evaluate this threat if you gave a zero score to Likelihood of Exposure. Otherwise, assign a score based on the population within a 1-mile radius (use the same 1-mile radius population you evaluate for air pathway population targets):

Population Within One Mile	Nearby Population Threat Score
< 10,000	1
10,000 to 50,000	2
> 50,000	4

Soil Exposure Pathway Score: Sum the Resident Population Threat score and the Nearby Population Threat score, subject to a maximum of 100.

SOIL EXPOSURE PATHWAY SCORESHEET

Pathway Characteristics	
Do any people live on or within 200 ft of areas of suspected contamination?	Yes ___ No ✓
Do any people attend school or daycare on or within 200 ft of areas of suspected contamination?	Yes ___ No ✓
Is the facility active? Yes ___ No ✓ If yes, estimate the number of workers: 11	

	Suspected Contamination	References
LIKELIHOOD OF EXPOSURE		
1. SUSPECTED CONTAMINATION: Surficial contamination can generally be assumed, and a score of 550 assigned. Assign zero only if the absence of surficial contamination can be confidently demonstrated. LE =	550	
RESIDENT POPULATION THREAT TARGETS		
2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or daycare on or within 200 feet of areas of suspected contamination (see Soil Exposure Pathway Criteria List, page 18). ___ people x 10 =	0	
3. RESIDENT INDIVIDUAL: If you have identified a resident population (factor 2), assign a score of 50; otherwise, assign a score of 0.	0	
4. WORKERS: Use the following table to assign a score based on the total number of workers at the facility and nearby facilities with suspected contamination:	5	

Number of Workers	Score
0	0
(1 to 100)	(5)
101 to 1,000	10
> 1,000	15

11 Workers

5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Use PA Table 7 to assign a value for each terrestrial sensitive environment on an area of suspected contamination:	0	

Terrestrial Sensitive Environment Type	Value

Sum =

6. RESOURCES	0	
T =	5	
WASTE CHARACTERISTICS		
7. Assign the waste characteristics score calculated on page 4. WC =	18	

RESIDENT POPULATION THREAT SCORE: $\frac{LE \times T \times WC}{82,500}$ = 0.6

NEARBY POPULATION THREAT SCORE: 1.0

SOIL EXPOSURE PATHWAY SCORE:
Resident Population Threat + Nearby Population Threat = 1.6

PA TABLE 7: SOIL EXPOSURE PATHWAY
TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

Terrestrial Sensitive Environment	*Assigned Value*
Terrestrial critical habitat for Federally designated endangered or threatened species	100
National Park	
Designated Federal Wilderness Area	
National Monument	
Terrestrial habitat known to be used by Federally designated or proposed threatened or endangered species	75
National Preserve (terrestrial)	
National or State terrestrial Wildlife Refuge	
Federal land designated for protection of natural ecosystems	
Administratively proposed Federal Wilderness Area	
Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding	
Terrestrial habitat used by State designated endangered or threatened species	50
Terrestrial habitat used by species under review for Federal designated endangered or threatened status	
State lands designated for wildlife or game management	25
State designated Natural Areas	
Particular areas, relatively small in size, important to maintenance of unique biotic communities	

AIR PATHWAY CRITERIA LIST

This "Criteria List" helps guide the process of developing a hypothesis as to whether a release to the air is likely to be detected. The check-boxes record your professional judgment. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypothesis, list them at the bottom of the page or attach an additional page.

The "Suspected Release" section identifies several conditions that could provide insight as to whether a release from the site is likely to be detected. If a release is suspected, primary targets are any residents, workers, students, and sensitive environments on or within ¼ mile of the site.

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question. If you check the "Suspected Release" box as "yes," make sure you assign a Likelihood of Release value of 550 for the pathway.

AIR PATHWAY CRITERIA LIST

SUSPECTED RELEASE				*PRIMARY TARGETS*
Yes	No	Unk		
☐	☐	☐	Are odors currently reported?	If you suspect a release to air, evaluate all populations and sensitive environments within 1/4 mile (including those onsite) as primary targets.
☐	☐	☐	Has release of a hazardous substance to the air been directly observed?	
☐	☐	☐	Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?	
☐	☐	☐	Does analytical or circumstantial evidence suggest a release to the air?	
☐	☐		Other criteria? _____	
☐	☐		**SUSPECTED RELEASE?**	

Summarize the rationale for Suspected Release (attach an additional page if necessary):

N/A

AIR PATHWAY SCORESHEET

Pathway Characteristics

Answer the questions at the top of the page. Refer to the Air Pathway Criteria List (page 21) to hypothesize whether you suspect that a hazardous substance release to the air could be detected. Due to dispersion, releases to air are not as persistent as releases to water migration pathways and are much more difficult to detect. Develop your hypothesis concerning the release of hazardous substances to air based on "real time" considerations. Record the distance (in feet) from any source to the nearest regularly occupied building.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Air Pathway Criteria List (page 21). If you suspect a release to air, use only Column A for this pathway and do not evaluate factor 2.

2. **No Suspected Release:** If you do not suspect a release, enter 500 and use only Column B for this pathway.

Targets (T)

3. **Primary Target Population:** Evaluate populations subject to exposure from release of a hazardous substance from the site. If you suspect a release, the resident, student, and worker populations on and within ¼ mile of the site are considered primary target population. If only the number of residences is known, use the average county residents per household (rounded up to the next integer) to determine the population. In the space provided, enter this population. Multiply the population by 10 to determine the Primary Target Population score. Note that if you do not suspect a release, there can be no primary target population.

4. **Secondary Target Population:** Evaluate populations in distance categories not suspected to be subject to exposure from release of a hazardous substance from the site. If you suspect a release, residents, students, and workers in the ¼- to 4-mile distance categories are secondary target population. If you do not suspect a release, all residents, students, and workers onsite and within 4 miles are considered secondary target population.

Use PA Table 8 (page 23). Enter the population in each secondary target population distance category, circle the assigned value, and record it on the far-right side of the table. Sum the far-right column and enter the total as the Secondary Target Population factor score.

5. **Nearest Individual** represents the threat posed to the person most likely to be exposed to a hazardous substance release from the site. If you have identified a primary target population, enter 50. Otherwise, assign the score from PA Table 8 (page 23) for the closest distance category in which you have identified a secondary target population.

6. **Primary Sensitive Environments:** If a release is suspected, all sensitive environments on or within ¼ mile of the site are considered primary targets. List them and assign values for sensitive environment type (from PA Table 5, page 16) and/or wetland acreage (from PA Table 9, page 23). Sum the values and enter the total as the factor score.

7. **Secondary Sensitive Environments:** If a release is suspected, sensitive environments in the ¼- to ½-mile distance category are secondary targets; greater distances need not be evaluated because distance weighting greatly diminishes the impact on site score. If you do not suspect a release, all sensitive environments on and within ½ mile of the site are considered secondary targets. List each secondary sensitive environment on PA Table 10 (page 23) and assign a value to each using PA Tables 5 and 9. Multiply each value by the indicated distance weight and record the product in the far-right column. Sum the products and enter the total as the factor score.

8. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if there is no land resource use within ½ mile.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

Waste Characteristics (WC)

9. **Waste Characteristics:** Score is assigned from page 4. However, if you have identified any primary target for the air pathway, assign either the score calculated on page 4 or a score of 32, whichever is greater.

Air Pathway Score: Multiply the scores for LR, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

AIR PATHWAY SCORESHEET

Pathway Characteristics	
Do you suspect a release (see Air Pathway Criteria List, page 21)?	Yes ___ No ___
Distance to the nearest individual:	___ ft

	A Suspected Release	B No Suspected Release	Reference
LIKELIHOOD OF RELEASE			
1 SUSPECTED RELEASE: If you suspect a release to air (see page 21), assign a score of 550. Use only column A for this pathway.			
2 NO SUSPECTED RELEASE: If you do not suspect a release to air, assign a score of 500. Use only column B for this pathway.			
LR =			
TARGETS			
3 PRIMARY TARGET POPULATION: Determine the number of people subject to exposure from a suspected release of hazardous substances to the air. ___ people x 10 =			
4 SECONDARY TARGET POPULATION: Determine the number of people not suspected to be exposed to a release to air, and assign the total population score using PA Table 6.			
5 NEAREST INDIVIDUAL: If you have identified any Primary Target Population for the air pathway, assign a score of 50; otherwise, assign the Nearest Individual score from PA Table 6.			
6 PRIMARY SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (PA Table 5) and wetland acreage values (PA Table 9) for environments subject to exposure from a suspected release to the air.			
Sensitive Environment Type / Value: ___ / ___ ; ___ / ___			
Sum =			
7 SECONDARY SENSITIVE ENVIRONMENTS: Use PA Table 10 to determine the score for secondary sensitive environments.			
8 RESOURCES			
T =			
WASTE CHARACTERISTICS			
9 A. If you have identified any Primary Target for the air pathway, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.			
B. If you have NOT identified any Primary Target for the air pathway, assign the waste characteristics score calculated on page 4.			
WC =			

AIR PATHWAY SCORE: $\dfrac{LR \times T \times WC}{82{,}500}$ = ___

PA TABLE 8: VALUES FOR SECONDARY AIR TARGET POPULATIONS

Distance from Site	Population	Nearest Individual (choose highest)	Population Within Distance Category: 1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	Greater than 1,000,000	Population Value
Onsite	_____	20	1	2	5	16	52	163	521	1,633	5,214	16,326	52,136	163,246	_____
>0 to ¼ mile	_____	20	1	1	1	4	13	41	130	408	1,303	4,081	13,034	40,811	_____
> ¼ to ½ mile	_____	2	0	0	1	1	3	9	28	88	282	882	2,816	8,816	_____
> ½ to 1 mile	_____	1	0	0	0	1	1	3	8	26	83	261	834	2,612	_____
> 1 to 2 miles	_____	0	0	0	0	0	1	1	3	8	27	83	266	833	_____
> 2 to 3 miles	_____	0	0	0	0	0	1	1	1	4	12	38	120	376	_____
> 3 to 4 miles	_____	0	0	0	0	0	0	1	1	2	7	23	73	228	_____

Nearest Individual = _____ Score = _____

PA TABLE 9: AIR PATHWAY VALUES FOR WETLAND AREA

Wetland Area	Assigned Value
Less than 1 acre	0
1 to 50 acres	25
Greater than 50 to 100 acres	75
Greater than 100 to 150 acres	125
Greater than 150 to 200 acres	175
Greater than 200 to 300 acres	250
Greater than 300 to 400 acres	350
Greater than 400 to 500 acres	450
Greater than 500 acres	500

PA TABLE 10: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY SECONDARY SENSITIVE ENVIRONMENTS

Distance	Distance Weight	Sensitive Environment Type and Value (from PA Table 6 or 9)	Product
Onsite	0.10	x _____	
		x _____	
0-1/4 mi	0.025	x _____	
		x _____	
		x _____	
1/4-1/2 mi	0.0054	x _____	
		x _____	
		x _____	
		x _____	

Total Environments Score = _____

SITE SCORE CALCULATION

In the column labeled S, record the Ground Water Pathway score, the Surface Water Pathway score, the Soil Exposure Pathway score, and the Air Pathway score. Square each pathway score and record the result in the S^2 column. Sum the squared pathway scores. Divide the sum by 4, and take the square root of the result to obtain the Site Score.

SUMMARY

Answer the summary questions, which ask for a qualitative evaluation of the relative risk of targets being exposed to a hazardous substance from the site. You may find your responses to these questions a good cross-check against the way you scored the individual pathways. For example, if you scored the ground water pathway on the basis of no suspected release and secondary targets only, yet your response to question #1 is "yes," this presents apparently conflicting conclusions that you need to reconsider and resolve. Your answers to the questions on page 24 should be consistent with your evaluations elsewhere in the PA scoresheets package.

SITE SCORE CALCULATION

	S	S^2
GROUND WATER PATHWAY SCORE (S_{gw}):	4.0	16
SURFACE WATER PATHWAY SCORE (S_{sw}):	27.2	729
SOIL EXPOSURE PATHWAY SCORE (S_s):	1.6	1.1236
AIR PATHWAY SCORE (S_a):	NA	
SITE SCORE: $\sqrt{\frac{S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2}{4}}$		13.7

SUMMARY

	YES	NO
1. Is there a high possibility of a threat to any nearby drinking water well(s) by migration of a hazardous substance in ground water?	☐	●
A. If yes, identify the well(s). _____		
B. If yes, how many people are served by the threatened well(s)? _____		
2. Is there a high possibility of a threat to any of the following by hazardous substance migration in surface water?		
A. Drinking water intake	☐	■
B. Fishery	☐	■
C. Sensitive environment (wetland, critical habitat, others)	☐	■
D. If yes, identify the target(s). _____		
3. Is there a high possibility of an area of surficial contamination within 200 feet of any residence, school, or daycare facility?	☐	■
If yes, identify the property(ies) and estimate the associated population(s). _____		
4. Are there public health concerns at this site that are not addressed by PA scoring considerations? If yes, explain: _____	☐	■

DEPARTMENT OF THE ARMY

SOUTH ATLANTIC DIVISION, CORPS OF ENGINEERS
ROOM 313, 77 FORSYTH ST., S.W.
ATLANTA, GEORGIA 30335-6801

HC
Ref 5867
ZY-Former Craig AFB/Craig Field

REPLY TO
ATTENTION OF

CESAD-PD-R (200) 8 MAR 1991

MEMORANDUM FOR

COMMANDER, USACE, ATTN: CEMP-ZA, WASH DC 20314-1000

COMMANDER, MISSOURI RIVER DIVISION, P.O. BOX 103
DOWNTOWN STATION, OMAHA, NE 68101-0103

COMMANDER, HUNTSVILLE DIVISION, P.O. BOX 1600,
HUNTSVILLE, AL 35807-4301

SUBJECT: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS), Inventory Project Report (INPR) for Site No. I04AL005000, Craig Air Force Base, Selma, AL 36701

1. I am forwarding the INPR for the Craig Air Force Base for appropriate action. This report is in the "old" format because it was in preparation before the "new" format was implemented. The site and the proposed containerized/hazardous and toxic waste (CON/HTW) project are eligible for DERP-FUDS.

2. I recommend that CEMP-R approve the proposed CON/HTW project and assign it through this headquarters to CESAM for remedial design and remedial action.

3. Questions concerning the INPR should be directed to Gary Mauldin, CESAD-PD-R, at COMM 404-331-6043 or FTS 841-6043. The Division focal point for actions beyond the preliminary assessment phase is Richard Connell, CESAD-PM-H, at COMM 404-331-7045 or FTS 841-7045.

Encl

for JOHN F. SOBKE LTC E
Major General, USA
Commanding

CF (w/encl):
CESAD-PM-H
CESAM-PD-E
CEMP-R

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM (DERP)
FOR FORMERLY USED DOD SITES
INVENTORY PROJECT REPORT
THE FORMER CRAIG AIR FORCE BASE
SELMA, DALLAS COUNTY, ALABAMA
PROJECT NO. I04AL005002

TABLE OF CONTENTS

PART I - PROJECT DESCRIPTION

PROJECT DESCRIPTION
FOR
THE FORMER CRAIG AIR FORCE BASE
SELMA, DALLAS COUNTY, ALABAMA
PROJECT NO. I04AL005002

1. INTRODUCTION:

At the request of the South Atlantic Division, the Mobile District performed a site inspection to assess possible hazardous/toxic wastes contamination and unsafe debris at the former Craig Air Force Base (AFB), near Selma, Alabama. The initial Inventory Report for this site (Project No. I04AL005000) recommended an unsafe debris removal project and a confirmation study. The unsafe debris project was carried out in 1986 and the confirmation study was conducted in October 1985 by Law Environmental Services Inc., of Atlanta, Georgia under the tasking and direction of the Huntsville Division. Following the completion of the confirmation study, an additional report (Project No. I04AL005001) recommending a Remedial Investigation/Feasibility Study (RI/FS) was submitted.

2. PROJECT DESCRIPTION:

A subsequent site inspection in April 1989 revealed the presence of 25 underground storage tanks which were used for the storage of motor, aviation and heating fuels necessary for the operation of the base. In addition, two abandoned transformers were also found at the site. No monitoring wells have been installed nor has there been testing for contamination near the underground storage tanks or the transformers. It is recommended that a low level hazardous/toxic waste removal project be implemented at the site for remediation of the underground storage tanks and transformers.

3. DESCRIPTION OF SITE

The project site is currently owned by the Craig Field Airport and Industrial Authority. The Authority is a joint City County organization which was formed in the late 1970's to receive the disposition of the properties at Craig AFB from the General Services Administration. Currently the Authority has leased or sold industrial sites to several industrial clients. There are also other commercial/institutional facilities located at the project site.

ATTACHMENT 1 - PRELIMINARY ASSESSMENT

PRELIMINARY ASSESSMENT
FOR
CRAIG AIR FORCE BASE
PROJECT NO. I04AL005002

SITE NAME: Craig Field Industrial Complex (Craig Air Force Base).

LOCATION: Selma, Dallas County, Alabama

DESCRIPTION OF PROBLEM: A site investigation in April 1989 revealed the presence of 25 abandoned underground storage tanks which were used for the storage of motor, aviation and heating fuels. In addition, two fallen and abandoned transformers were also found at the site. It is possible that the abandoned tanks and transformers are leaking their contents into the ground.

SITE HISTORY: Craig AFB was occupied by the United States Government in 1940, under lease from the City of Selma. The leased land was conveyed to the United States by deeds dated 26 October 1948 and 7 October 1950. The total installation encompassed 2,577 acres. By quitclaim deed dated 30 May 1978, the General Services Administration (GSA) conveyed fee title to 1,791 acres to Craig Field Airport and Industrial Authority. By quitclaim deed dated 4 January 1979, the Secretary of the Interior conveyed fee title to an additional 207 acres to the Craig Field Airport and Industrial Authority for public purposes.

AVAILABLE STUDIES AND REPORTS: Previous Inventory Project Reports I04AL005000 and I04AL005001.

CATEGORY OF HAZARDS: Low level hazardous/toxic waste.

BASIS OF DOD RESPONSIBILITY: The underground storage tanks and transformers were left in place by DOD, without use by subsequent owners.

POC/DISTRICT: Jerry D. Jones, (205) 690-2725 Mobile District.

STATUS: The project site is currently owned by the City of Selma, Craig Field Authority.

DESCRIPTION OF PROPOSED REMEDIAL ACTION: The project as proposed consists of sampling and testing of the contents of each underground storage tank and transformer, remediation of the tanks and transformers, and sampling and testing of the ground water and soil near the removed tanks and transformers.

ESTIMATED COSTS: $498,331

ATTACHMENT 2 - COST ESTIMATE

FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

1. COMPONENT	FY 19__ MILITARY CONSTRUCTION PROJECT DATA	2. DATE
ARMY		14 Sept 89

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
Craig Air Force Base, Selma, Alabama	

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
Defense Environmental Restoration Program		I04A1005002	498,331

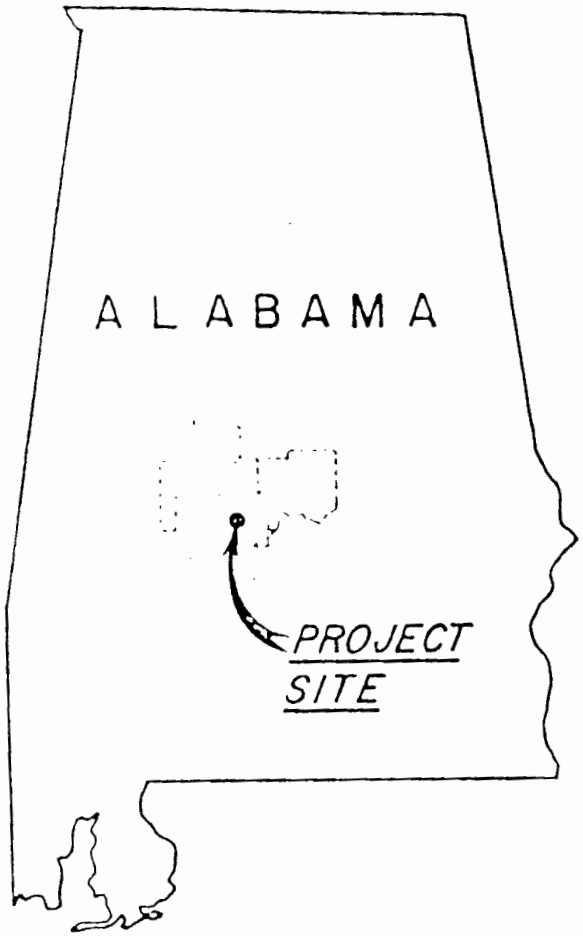
9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Construction Cost				304
Contingency (10%)				30
Construction Contract Cost				334
Supervision & Administration (8%)				27
Total Construction CWE				361
Engineering & Design (6%)				22
Field Surveys, Sampling and Testing				104
Total Implementation Cost				487

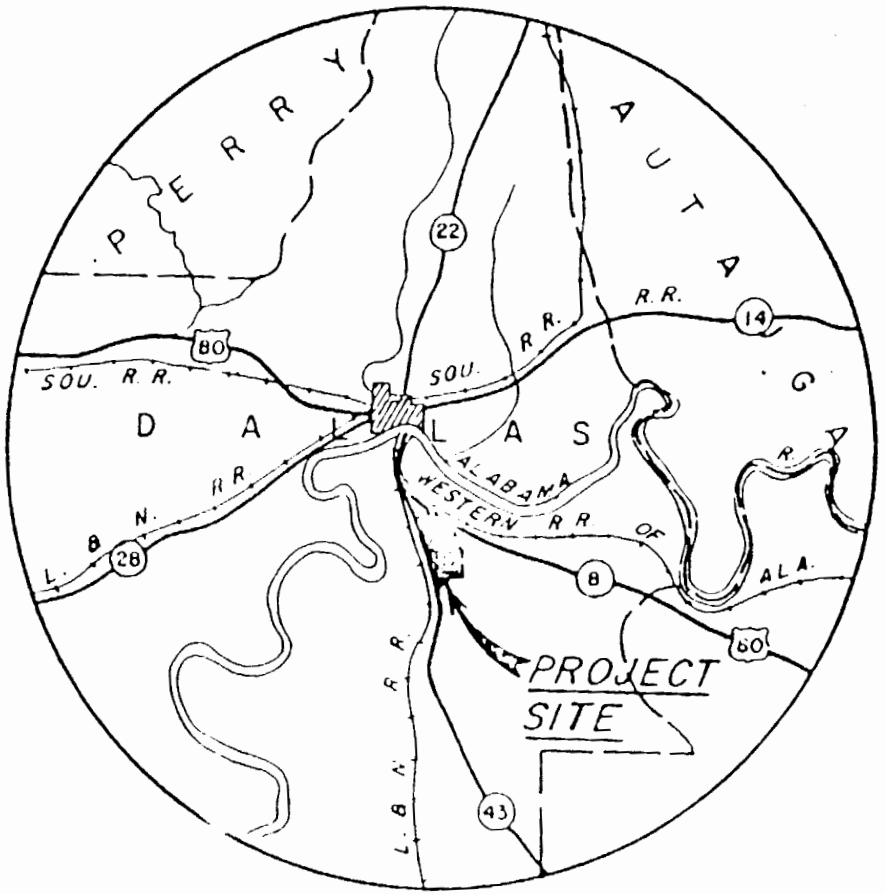
10. DESCRIPTION OF PROPOSED CONSTRUCTION

The project will consist of sampling and testing of the contents of 25 Underground Storage Tanks (UST's) and 2 Transformers, removal of the tanks and transformers, and sampling and testing of the soil and groundwater near the removed tanks and transformers.

ATTACHMENT 3 - SITE MAPS



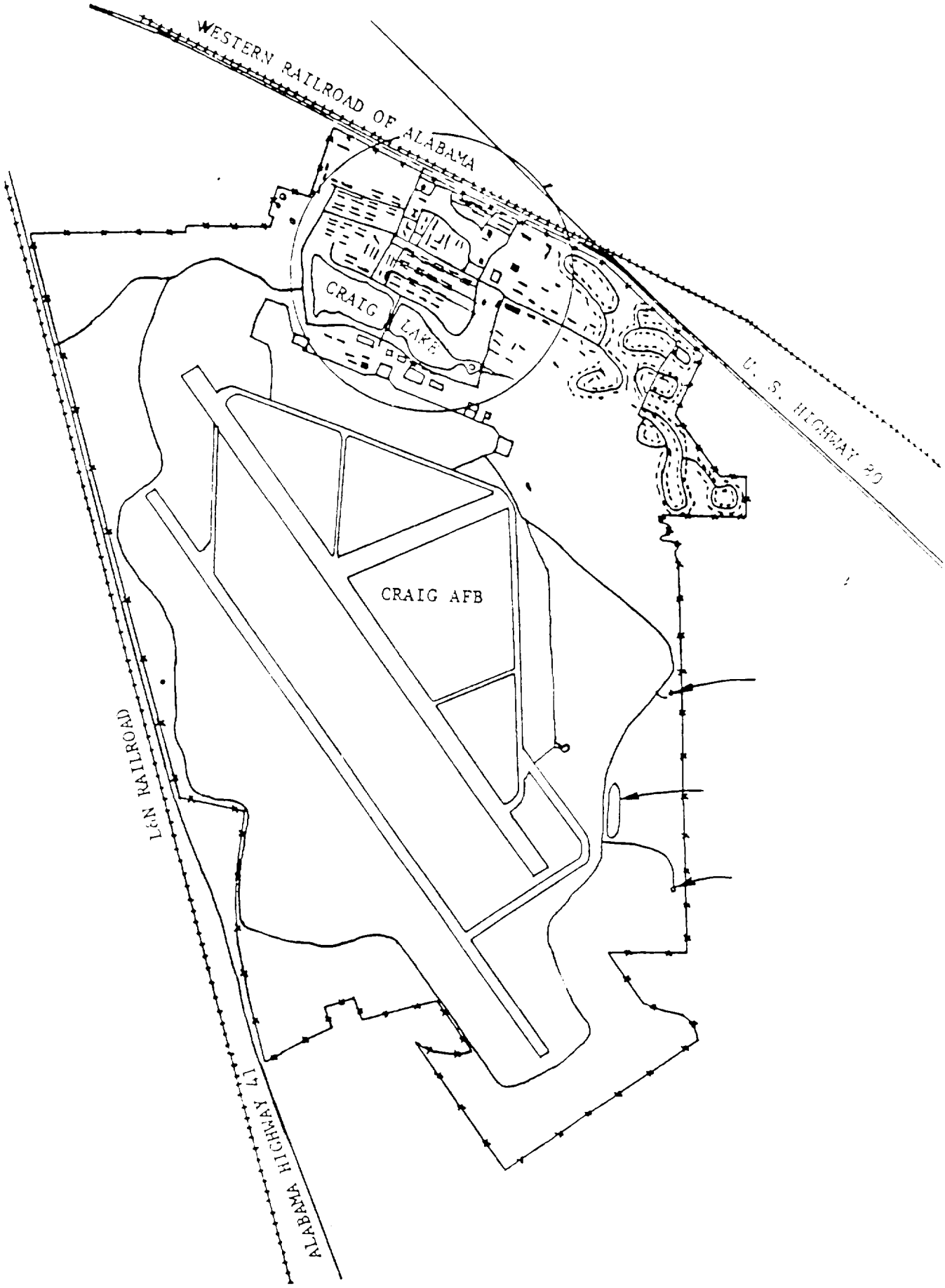
STATE INDEX



VICINITY MAP

SCALE IN MILES

0 10 20


WESTERN RAILROAD OF ALABAMA
CRAIG LAKE
U. S. HIGHWAY 80
CRAIG AFB
L&N RAILROAD
ALABAMA HIGHWAY 41

SITE MAP

ATTACHMENT 4 - STORAGE TANKS AND TRANSFORMERS SUMMARY

UNDERGROUND STORAGE TANK SUMMARY
For
Project No. I04AL005002

Underground Storage Tanks:

a. One-275 gallon heating oil tank: Approximate dimensions of the tank are 3 feet (diameter) x 5 feet (length). The tank is made of standard steel and is covered by approximately 2 feet of earth.

b. One-350 gallon heating oil tank: Approximate dimensions of the tank are 3.5 feet (diameter) x 5 feet (length). The tank is made of standard steel and is covered by approximately 2 feet of earth.

c. One-500 gallon heating oil tank: Approximate dimensions of the tank are 4 feet (diameter) x 5.5 feet (length). The tank is made of standard steel and is covered by approximately 2 feet of asphalt.

d. One-550 gallon heating oil tank: Approximate dimensions of the tank are 4 feet (diameter) x 6 feet (length). The tank is made of standard steel and is covered by approximately 2 feet of concrete.

e. One-1,000 gallon fuel tank: Approximate dimensions of the tank are 5.5 feet (diameter) x 6 feet (length). The tank is made of standard steel and is covered by approximately 2 feet of asphalt.

f. One-1,200 gallon fuel tank: Approximate dimensions of the tank are 5.5 feet (diameter) x 7 feet (length). The tank is made of standard steel and is covered by approximately 2 feet of earth.

g. One-1,620 gallon fuel tank: Approximate dimensions of the tank are 5.5 feet (diameter) x 8 feet (length). The tank is made of standard steel and is covered by approximately 2 feet of earth.

h. Four-2,000 gallon heating oil tanks: Approximate dimensions of the tanks are 6 feet (diameter) x 9 feet (length). All of the tanks are made of standard steel and are covered by approximately 2 feet of gravel and dirt.

i. One-2,500 gallon solvent tank: Approximate dimensions of the tank are 6 feet (diameter) x 12 feet (length). The tank is made of standard steel and is covered by approximately 2 feet of earth.

j. Six-5,000 gallon motor fuel tanks: Approximate dimensions of the tanks are 8 feet (diameter) x 13.5 feet (length). All of the tanks are made of standard steel and are covered by approximately 8 inches of concrete.

k. Two-6,000 gallon motor fuel tanks: Approximate dimensions of the tanks are 8.5 feet (diameter) x 13.5 feet (length). Both tanks are made of standard steel. One is covered by approximately 4 feet of earth and the other is covered by approximately 8 inches of concrete.

l. One-10,000 gallon fuel tank: Approximate dimensions of the tank are 12.5 feet (diameter) x 18 feet (length). The tank is made of standard steel and is covered by approximately 4 feet of grass and earth.

2. Above Ground Tanks:

a. Two-2,500 gallon horizontal tar storage tanks: Approximate dimensions of the tanks are 5 feet (diameter) x 15 feet (length). The tanks are made of standard steel and are situated on metal braces approximately 3 feet off the ground.

b. Two-500,000 gallon vertical JP-4 jet fuel storage tanks: Approximate dimensions of the tanks are 50 feet (diameter) x 35 feet (height). The tanks are made of standard steel and the base of the tanks are flush with the ground.

3. Transformers:

Two-25 gallon transformers which are situated on a fallen power line.

4. This project will also include the draining and flushing of approximately 2,000 linear feet of 8-inch fuel lines. This effort will not require the disturbance of soil nor concrete areas.

PART II - FINDINGS AND DETERMINATION OF ELIGIBILITY

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM (DERP)
FOR FORMERLY USED DEFENSE SITES
FINDINGS AND DETERMINATIONS OF ELIGIBILITY
THE FORMER CRAIG AIR FORCE BASE
SELMA, DALLAS COUNTY, ALABAMA
PROJECT NO. I04AL005002

FINDINGS OF FACT

1. A low level hazardous/toxic waste remediation project is proposed for the former Craig Air Force Base (AFB) located in Selma, Dallas County, Alabama. The project as proposed consists of the removal of 25 Underground Storage Tanks (UST's) which were used for the storage of motor, aviation, and heating fuels. There are also two abandoned transformers. It is very possible that some or all of the tanks and transformers have begun to leak their contents into the surrounding ground. The items proposed for removal are potential sources of environmental contamination.

2. Craig AFB was occupied by the United States Government in 1940, under lease from the city of Selma. The total installation encompassed approximately 2,577 acres of which 2,577 acres were acquired in fee, 310 acres in easements, 10 acres by license, 1 acre by permit, and 5 acres by lease. The leased land was conveyed to the United States by deeds dated 26 October 1948 and 7 October 1950.

3. Craig AFB consisted of a housing area, runways, control tower, and other facilities needed to maintain a complete Department of Defense (DOD) Air Force installation. The property was used from 1940 until the early 1970's as an Air Corps Specialized Flying School for the training of Air Force pilots.

4. By quitclaim deed dated 30 May 1978, the General Services Administration (GSA) conveyed fee title to 1,791 acres to Craig Field Airport and Industrial Authority. By quitclaim deed dated 4 January 1979, the Secretary of the Interior conveyed fee title to an additional 207 acres to the Industrial Authority for public purposes. The deed contains the standard provisions of conveyances for public park and recreation purposes, including a requirement for the Department of Interior consent before property disposal and a reversionary clause applicable to a determination of national defense needs. Between February 1979 and May 1982, GSA conveyed additional parcels (totaling 579 acres including easements) to the Authority. There are no conditions or clauses in these deeds which obligate the DOD to perform site restoration.

5. Currently the Authority has leased or sold industrial sites to eight clients. The largest industries are Beech Aircraft-Selma Division, and American Candy. In addition to the eight industries, other facilities (commercial/institutional) at the site include: the Alabama Department of Corrections Training Center, the Alabama State Police-Troop F, a National Guard unit, a Dallas County Elementary school, a Public Library, the George Wallace (satellite facility), a Head Start Center, a commodity food storage warehouse, a golf course, and other commercial establishments.

DETERMINATION

Based on the foregoing Findings of Fact, the Former Craig Air Force Base has been determined to have been formerly used by DOD. Moreover, it is determined that an environmental restoration project, to the extent proposed herein, is an appropriate undertaking within the purview of 10 U.S.C. 2701, et seq., for the reasons stated above.

8 MAY 91
DATE

for KLEIN LTC EN
JOHN F. SOBKE
Major General, USA
Commanding

PART III - POLICY CONSIDERATIONS

POLICY CONSIDERATIONS
FOR THE
FORMER CRAIG AIR FORCE BASE
PROJECT NO. I04AL005002

Current DOD policy permits remediation of DOD generated hazardous and toxic waste regardless of the ownership status of the site. With respect to the former Craig Air Force Base, the hazardous/toxic waste is the result of prior DOD use of the site.

PART IV - PROJECT RECOMMENDATIONS

PROJECT RECOMMENDATIONS
FOR THE
FORMER CRAIG AIR FORCE BASE
PROJECT NO. I04AL005002

1. It is recommended that a low level hazardous/toxic waste remediation project be performed at the former Craig Air Force Base.

2. This project has a Hazardous Ranking Score of 122. In addition, due to the high number of underground storage tanks, and the possibility that fuels still remain in the tanks and the probability of PCB's leaking from the fallen transformers, it is recommended that this project receive a high priority for implementation. The implementation priority also reflects consideration for the health of the large number of people who live near or work at facilities located at the project site. In addition, the implementation priority also reflects consideration for the proximity of the hazardous materials to Craig lake which is a very attractive fishing spot for local residents.

Ref 5867

AL

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM (DERP)
FOR FORMERLY-USED DEPARTMENT OF DEFENSE (DOD) SITES
INVENTORY PROJECT REPORT
CRAIG AIR FORCE BASE
SELMA, DALLAS COUNTY, ALABAMA
PROJECT NO. I04AL005001

TABLE OF CONTENTS

2Y - Former Craig AFB/ Craig Field Report

PART I PROJECT DESCRIPTION

PROJECT DESCRIPTION
FOR
CRAIG AIR FORCE BASE
SELMA, DALLAS COUNTY, ALABAMA
PROJECT NO. I04AL005001

1. INTRODUCTION:

At the request of the South Atlantic Division, the Mobile District performed a site inspection to assess possible hazardous/toxic wastes contamination and unsafe debris at the former Craig Air Force Base (AFB), near Selma, Alabama. The initial Inventory Report (Project No. I04AL005000) recommended an unsafe debris removal project and confirmation study. The unsafe debris project was carried out in 1986. The confirmation study was conducted in October 1985 by Law Environmental Services Inc., of Atlanta, Georgia under the tasking and direction of the Huntsville Division.

2. PROJECT DESCRIPTION:

The confirmation study revealed the presence of chemical contaminants, which are indicative of the type of chemicals that the Air Force used while in control of the site. Further indepth testing of the soil and ground and surface waters is proposed at the site in order to determine the extent and rate of movement of the chemical contaminants.

3. DESCRIPTION OF SITE

The project site is currently owned by the Craig Field Airport and Industrial Authority. The Authority is a joint City/County organization which was formed in the late 1970's to receive the disposition of the properties at Craig AFB from the General Services Administration. Currently the Authority has leased or sold industrial sites to several industrial clients. There are also other commercial/institutional facilities located at the project site. The entire site is enclosed by a chainlink fence, however, access to the site is relatively easy due to the frequent going and coming of persons who work at or attend commercial/institutional facilities located at the site. Anyone desiring to enter the project area would have no problems gaining access to the area.

ATTACHMENT 1 - SITE SURVEY SUMMARY SHEET

SITE SURVEY SUMMARY SHEET
FOR
DERP PROJECT NO. I04AL005001

SITE NAME: Craig Air Force Base (AFB).

LOCATION: Selma, Dallas County, Alabama.

DESCRIPTION OF PROBLEM: A confirmation study has revealed the presence of organic and inorganic chemical contamination at Craig AFB which are indicative of the type of chemicals that the Air Force used while in control of the site. The site contains chemical contaminants which are possibly dangerous to human health.

SITE HISTORY: The property was occupied by the Department of Defense in 1940, under lease from the City of Selma. The leased land was conveyed to the United States by deeds dated 26 October 1948 and 7 October 1950. The land was subsequently conveyed in fee to Craig Field Airport and Industrial Authority between May 1978 and May 1982. The total installation, including easements, encompassed 2,577 acres.

AVAILABLE STUDIES AND REPORTS: Defense Environmental Restoration Program Confirmation Report for Former Craig Air Force Base at Selma, Alabama prepared by Law Environmental Services, Atlanta, Georgia.

CATEGORY OF HAZARDS: Hazardous/toxic waste contamination.

BASIS OF DOD RESPONSIBILITY: The chemical contamination at the site is most likely the result of DOD use of chemicals to combat the fire-ant problem at the AFB and also the use of chemical solvents for maintenance and cleaning of mechanical workshops and aircraft during occupancy.

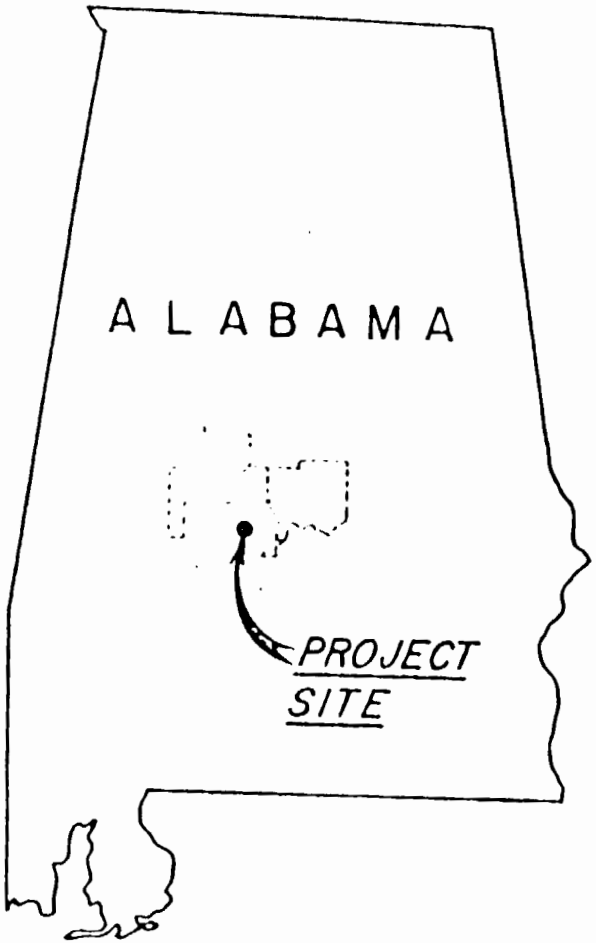
POC/DISTRICT: Jerry D. Jones, (205) 690-2725 Mobile District.

STATUS: The site is presently owned by Craig Field Airport and Industrial Authority. Some of the land has been leased or sold to private industrial clients and other commercial/institutional entities.

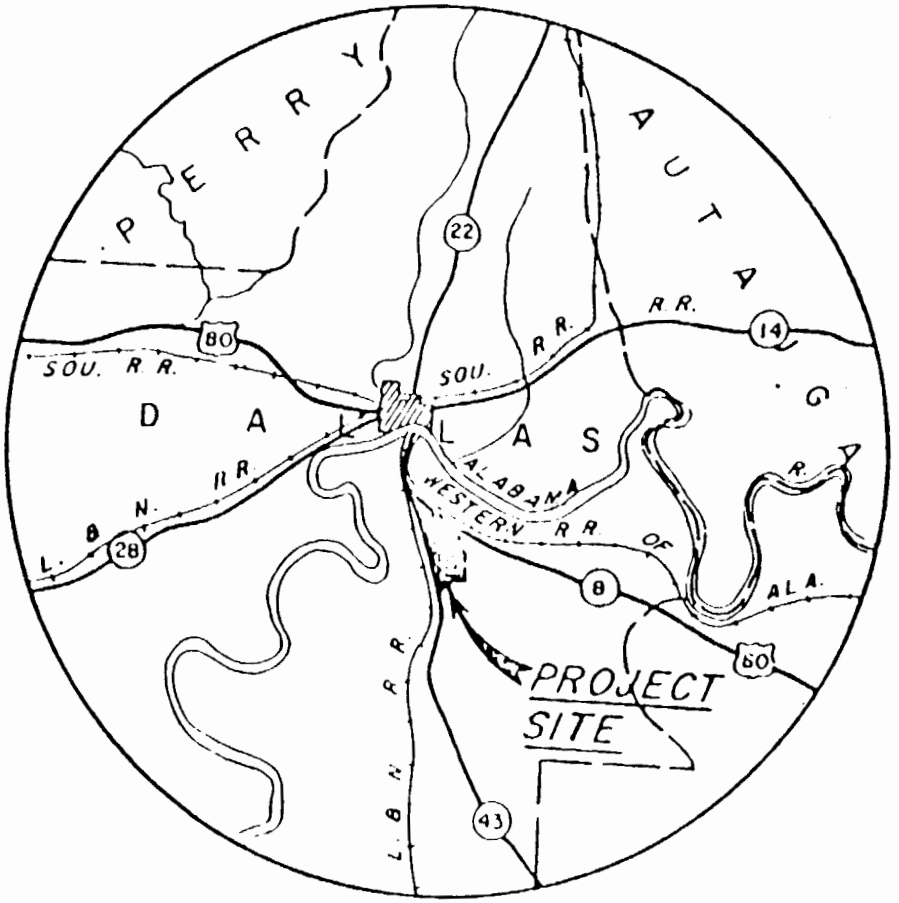
DESCRIPTION OF PROPOSED REMEDIAL ACTION: The project consists of further investigation of contaminated surface and groundwaters, and soil in order to determine the extent and rate of movement of the chemical contaminants.

ESTIMATED COSTS: $425,000 (Prepared by the Missouri River Division)

ATTACHMENT 2 - SITE MAPS



STATE INDEX



VICINITY MAP

SCALE IN MILES

0 10 20

FIGURE A
VICINITY MAP

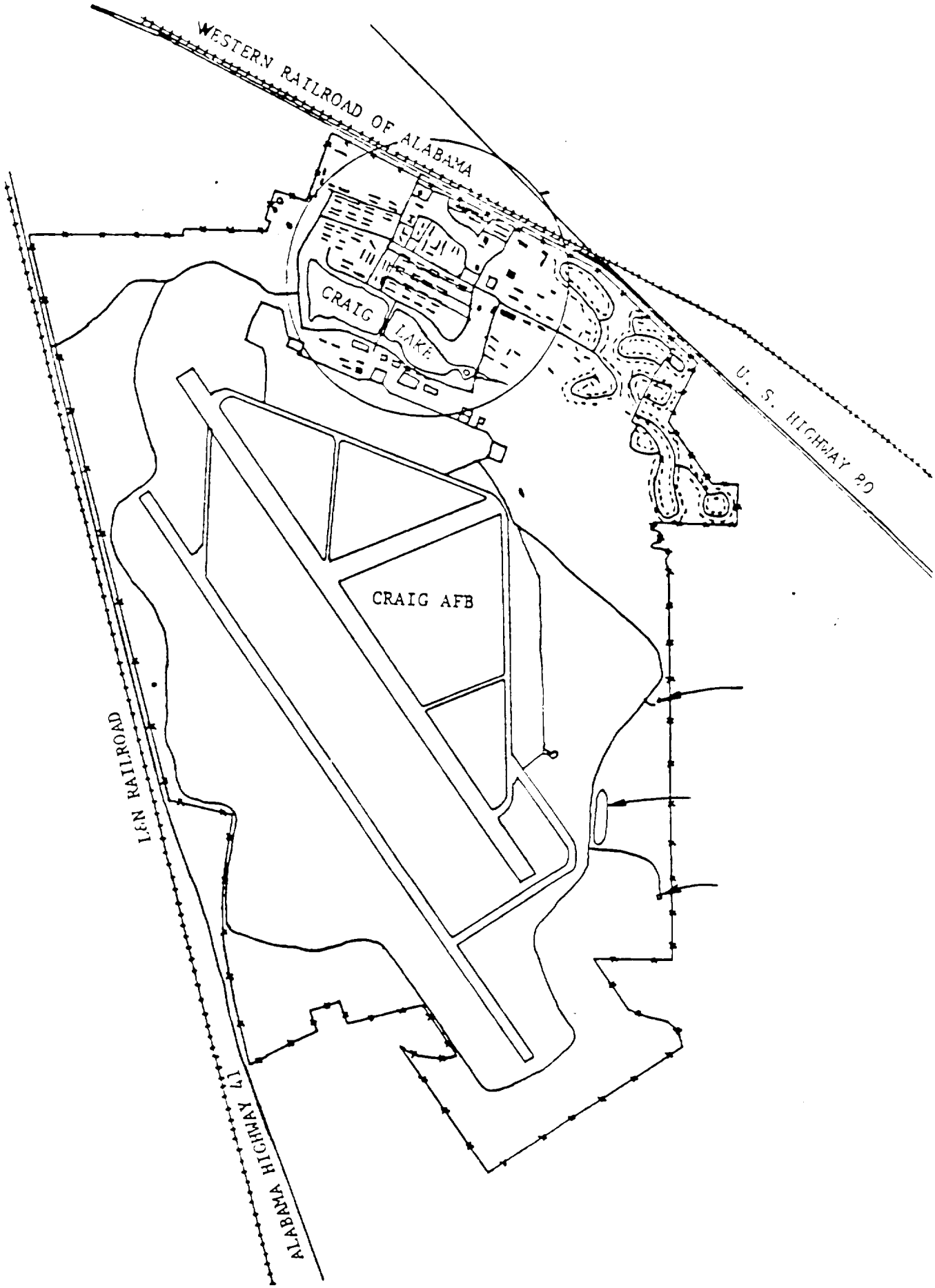


FIGURE B
SITE MAP

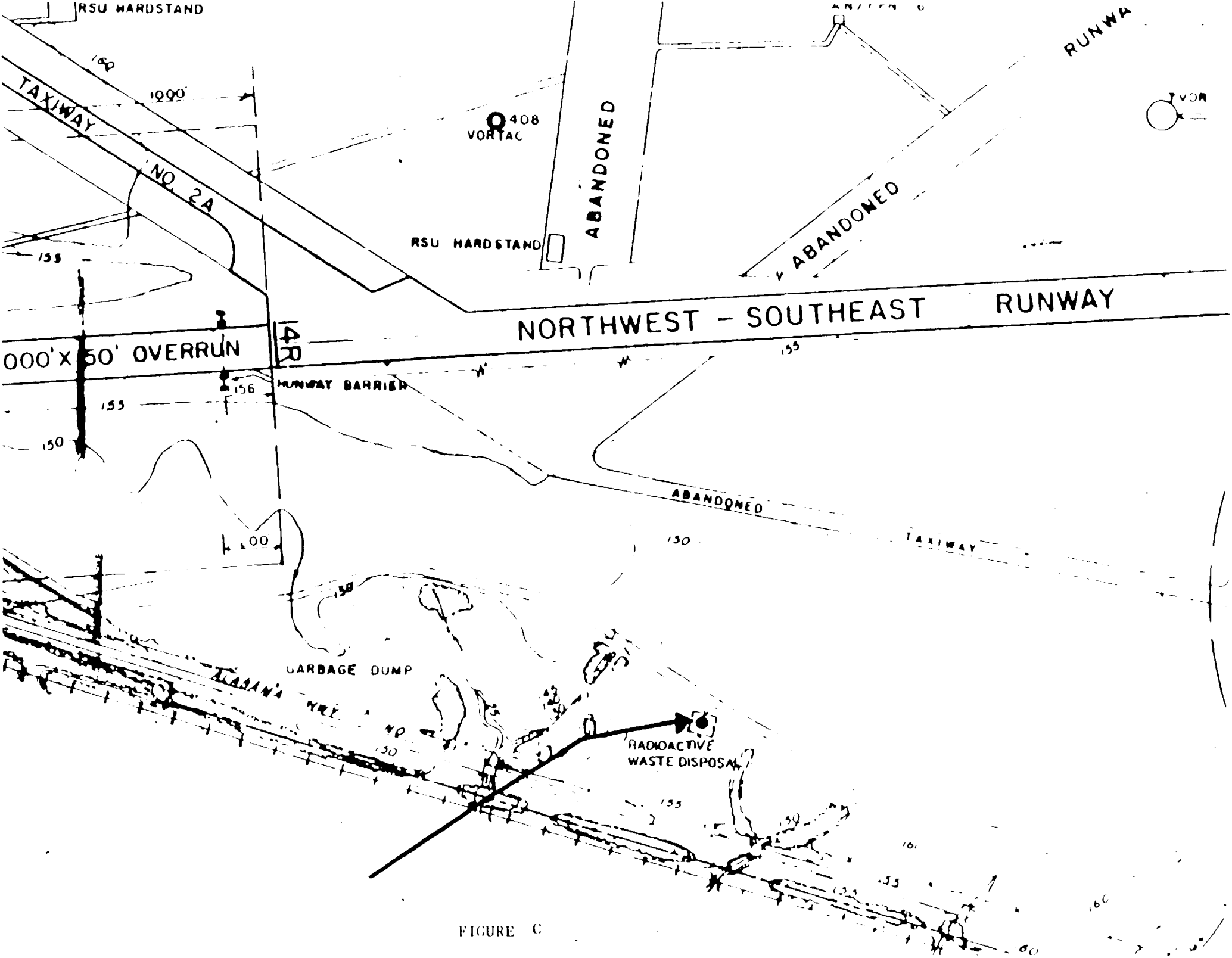

RSU HARDSTAND
TAXIWAY
NO. 2A
1000'
408
VORTAC
ABANDONED
RSU HARDSTAND
ABANDONED
VOR
NORTHWEST - SOUTHEAST RUNWAY
000'X 50' OVERRUN
420
RUNWAY BARRIER
ABANDONED
TAXIWAY
GARBAGE DUMP
RADIOACTIVE
WASTE DISPOSAL

FIGURE C

ATTACHMENT 3 COST ESTIMATE

1. COMPONENT	FY 19___ MILITARY CONSTRUCTION PROJECT DATA	2. DATE
ARMY		March 1988

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
Former Craig Air Force Base, Selma, Alabama	Craig AFB RI/FS

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
			425

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Phase I				
Collect Samples				25
Sample Analysis/Interpretation				20
Public Health Assessment (PHA)				20
				65
Phase .I				
Well Installation				40
Geophysics				50
Soil Gas				25
Sample Analysis/Interpretation				120
RI/FS Reports				80
				380
S & A				45
				425

10. DESCRIPTION OF PROPOSED CONSTRUCTION

Perform Remedial Investigation/Feasibility Study (RI/FS) in two phases under the Defense Environmental Restoration Program (DERP). The RI/FS will be used to determine the extent and rate of movement of chemical contamination at Craig AFB and to propose remedial alternatives for cleanup.

ATTACHMENT 4 - CONTAMINATION SUMMARY AND LIST OF TABLES

CONTAMINATION SUMMARY
FOR
PROJECT NO. I04AL005001

1. Law Environmental Services, of Atlanta, Georgia conducted a confirmation study for the Huntsville Division, Corps of Engineers in 1985. The study entailed sampling and analysis of the ground water, surface water, and soil at Craig Air Force Base (AFB) to determine if contamination exists that might be related to previous DOD activities. The chemical contaminants found at the site were indicative of the type of chemicals DOD use to control fire-ants and to clean maintenance workshops and aircraft at the site.

2. Analytical data from the confirmation study are summarized as follows:

a. Methylene chloride was found at all of the sampling locations. Concentrations ranged from less than 10 parts per billion (ppb) to 1100 ppb. Methylene chloride is a solvent commonly used for industrial cleaning. It is also used as a degreaser.

b. Butyl benzylphthalate was found in sediment samples SD1 and SD2 in concentrations of 230 parts per million (ppm) and 1.4 ppm, respectively. Phalate compounds represent a large family of chemicals used quite often as non-plasticizers: primary uses include pesticide carriers, cosmetics, munitions, industrial oils, and insect repellents.

c. Other volatile organic compounds found in samples include the following: benzene, chlorobenzene, ethyl benzene, toluene, trans-1,2 dichloroethane, trichloroethylene, and 1,1,2-trichloroethane. Concentrations for all of these compounds are less than 10 ppb, exceptethyl benzene. Ethyl benzene was present in monitoring well MW2 at a concentration of 51 ppb. Non-halogenated solvents, such as ethylbenzene,are listed as hazardous wastes in RCRA regulations. These solvents are widely used for industrial cleaning, diluents for insecticide, and as a component of automotive and aviation gasoline.

d. Inorganic substances were found in all of the monitoring wells and sediment samples. The primary constituents of concern are the heavy metals arsenic, cadmium, chromium, lead and selenium. The primary drinking water standards for each of these priority pollutants are as follows: arsenic - 0.05 parts per million (ppm), cadmium - 0.01 ppm, chromium - 0.05 ppm, lead - 0.05 ppm, and selenium - 0.01 ppm. Analytical results for heavy metals (arsenic, cadmium, chromium, lead and selenium) are summarized as follows: Monitoring well MW1 exceeds, or equals, the standards for cadmium, chromium and lead; MW2 exceeds or equals the standards for chromium and lead; MW3 exceeds for selenium; MW4 exceeds for chromium and lead;, and MW5 exceeds for chromium.

e. A total summary of the analytical results for the monitoring well samples (MW1-MW5), surface water samples (SW1- SW6), and sediment samples (SD1-SD6) are given in Tables 1, 2, and 3, respectively.

3. The Law report concluded that the operation of Craig AFB most likely caused the contamination of the soil and ground and surface waters at the project site. Chemical contamination found at the site is of concern to human health and the environment.

4. It is recommended that further investigation be performed at the site by the Missouri River Division to determine the extent and rate of movement of chemical contaminants.

5. In addition, the initial Inventory Report (Project No. I04AL00500) recommended that a radioactive waste disposal pit and a monitoring well located on the project site be investigated for possible hazardous materials. The subsequent confirmation study did not sufficiently address these possible hazards. Therefore, it is also recommended that these former DOD activities be evaluated during additional studies.

TABLE 1
WATER QUALITY DATA-WELLS
CRAIG AFB - SELMA, AL

VOLATILE ORGANICS (ppb)	MW1	MW2	MW3	MW4	MW5	MCL (ppm)
Benzene		<10				0.005
Chlorobenzene		<10				NA
Ethyl benzene		51				NA
Methylene chloride	1100	64	120	270	970	NA
Toluene		<10			<10	NA
Trans-1,2-dichloroethylene		<10				NA
Trichloroethylene					<10	0.005
BASE NEUTRALS (ppb)						
Bis(2-ethylhexyl) phthalate	82	<10			36	NA
Di-n-butylphthalate	<10	<10			<10	NA
Di-n-octylphthAlate	22					NA
Naphthalene		16				NA
Diethylphthalate		26				NA
ACID EXTRACTABLE						
2,4-Dimethylphenol		<10				NA
METALS (ppm)						
Cadmium	0.01					0.01
Chromium	0.13	0.05		0.06	0.05	0.05
Lead	0.13	0.13		0.11		0.05
Selenium			0.22			0.01

TABLE 2
WATER QUALITY DATA - SURFACE WATER
CRAIG AFB - SELMA, AL

VOLATILE ORGANICS (ppb)	SW1	SW2	SW3	SW4	SW5	SW6	MCL (ppm)
Methylene chloride	39	140	120	960	140	22	NA
Toluene			<10		<10		NA
1,1,2-trichloroethane		<10					NA
BASE NEUTRALS (ppb)							
Bis(2-ethylhexyl)phthalate				<10			NA

TABLE 3
WATER QUALITY DATA - SEDIMENTS
CRAIG AFB - SELMA, AL

VOLATILE ORGANICS (ppb)	SD1	SD2	SD3	SD4	SD5	SD6	MCL (ppm
Methylene chloride	85	73	36	10	<10	10	NA
BASE NEUTRALS (ppm)							
Acenaphthene		<1					NA
Bis(2-ethylnexyl)phthalate	<1	<1	<1				NA
Butyl benzylphthalate	230	1.4	<1				NA
3,4-benzofluoranthene	<1						NA
di-n-butylphthalate	<1						NA
Fluoranthene	<1	<1	<1				NA
Fluorene		<1					NA
Naphthalene	<1						NA
Phenanthrene		<1	<1				NA
Pyrene	<1	<1	<1				NA
METALS (ppm)							
Arsenic	<7	<12	<9	<20	<26	<30	0.05
Chromium	5.2	5.7	5.3	7.5	7.1	1.0	0.05
Lead	7.2	13	130	<7	<17	<10	0.05
Selenium	<5	<8	<6	<13	<17	<20	0.01

PART II. FINDINGS AND DETERMINATION OF ELIGIBILITY

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM (DERP)
FOR FORMERLY USED DOD SITES
FINDINGS AND DETERMINATION OF ELIGIBILITY
CRAIG AIR FORCE BASE
SELMA, DALLAS COUNTY, ALABAMA
PROJECT NO. I04AL005001

FINDINGS OF FACT

1. A phased Remedial Investigation/Feasibility Study to determine the rate and extent of hazardous/toxic waste contamination is proposed for the former Craig Air Force Base (AFB) located in Selma, Dallas County, Alabama. A debris removal project was completed at this site pursuant to Inventory Report No. I04AL005000. In 1985, Law Environmental Engineers performed a confirmation study at the site which entailed testing the soil, surface and ground waters for chemical contaminants. The testing confirmed the presence of contaminants which warrant remedial work at the site. The chemical contaminants found at the site are indicative of the type of chemicals that DOD used during occupancy of the site. The proposed project consists of further indepth testing of the soil, and surface and ground waters to determine the extent of contamination. If warranted, further remedial work would involve cleanup of contaminated areas at the site because of the possible adverse environmental impacts on human health.

2. Craig AFB consisted of a housing area, runways, control tower, and other facilities needed to maintain a complete DOD Air Force installation. Craig AFB was occupied by the United States Government in 1940, under lease from the City of Selma. The leased land was conveyed to the United States by deeds dated 26 October 1948 and 7 October 1950. The total installation encompassed 2,577 acres.

3. The property was used by the DOD from 1940 until the early 1970's as an Air Corps Specialized Flying School for the training of Air Force pilots.

4. By quitclaim deed dated 30 May 1978, the General Services Administration (GSA) conveyed fee title to 1,791 acres to Craig Field Airport and Industrial Authority. The deed restricted use to public airport purposes. There was a provision requiring the grantee to maintain the land and improvements for the use and benefit of the public as an airport. There was a provision relating to restoration of formerly leased premises which did not apply to these 1,791 acres fee. There was no recapture clause. By quitclaim deed dated 4 January 1979, the Secretary of the Interior conveyed an additional 207 acres fee to the Industrial Authority for public park and recreation purposes. The deed contained a recapture clause. There was no restoration provision. Between February 1979 and May 1982, GSA conveyed additional parcels (totaling 579 acres including easements) to the Authority. There were no recapture clauses or restoration provisions in these deeds. One of the deeds restricted use to health purposes for 30 years.

5. Currently the Authority has leased or sold industrial sites to eight clients. The largest industries are Beech Aircraft-Selma Division, and American Candy. In addition to the eight industries, other facilities (commercial/institutional) at the site include: the Alabama Department of

Corrections Training Center, the Alabama State Police-Troop F, a National Guard unit, a Dallas County Elementary school, a Public Library, the George Wallace College (satellite facility), a Head Start Center, a commodity food storage warehouse, a golf course, and other commercial establishments.

DETERMINATION

Based on the foregoing Findings of Fact, the site has been determined to have been formerly used by DOD. Moreover, it is determined that an environmental restoration project, to the extent proposed herein, is an appropriate undertaking within the purview of Defense Environmental Restoration Program, established under 10 U.S.C. 2701, et seq., for the reasons stated above.

23 May 89
Date

LLOYD A. DUSCHA, P.E.
Deputy Director
Directorate of Engineering
and Construction

PART III POLICY CONSIDERATIONS

POLICY CONSIDERATIONS
FOR
FORMER CRAIG AIR FORCE BASE
SELMA, DALLAS COUNTY, ALABAMA
PROJECT NO. I04AL005001

Current DOD policy permits remediation of DOD generated hazardous and toxic waste regardless of the ownership status of the site. With respect to the former Craig Air Force Base project, the contamination of the soil, surface water, and groundwater is most likely the result of DOD use of chemicals at the site to control fire-ant populations and also the use of solvents for maintenance and cleaning of maintenance workshops and aircraft.

PART IV PROJECT RECOMMENDATIONS

PROJECT RECOMMENDATIONS
FOR
FORMER CRAIG AIR FORCE BASE
SELMA, DALLAS COUNTY, ALABAMA
PROJECT NO. I04AL005001

1. It is recommended that a phased Remedial Investigation/Feasibility Study be performed by the Missouri River Division (MRD) at the site. Due to the Hazardous Ranking Score (HRS) of 5, the project should be placed on a moderate implementation priority. The implementation priority also reflects consideration for the health of people who work at or attend institutional facilities located at the project site, such as an elementary school, a head start center, and other similar facilities. The findings should be used for design and construction of a remedial project.